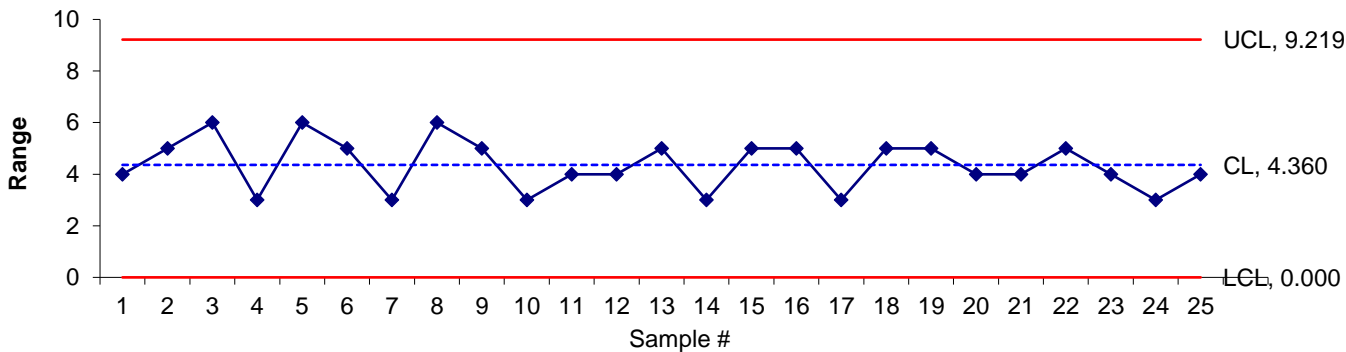
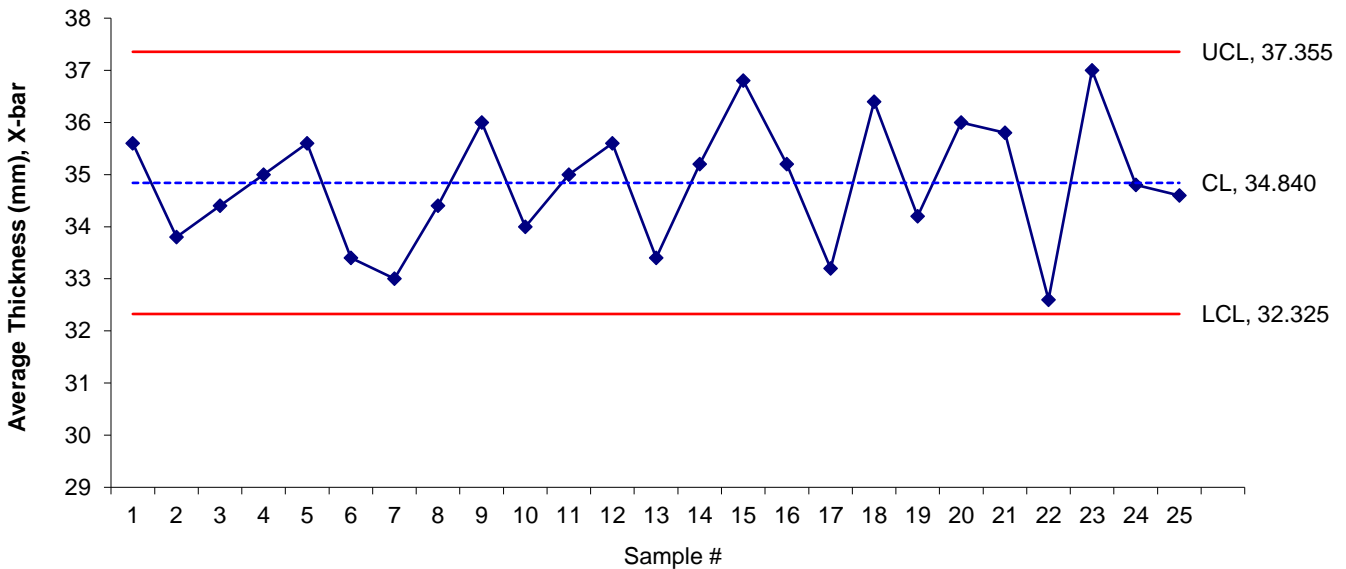


# Control Chart for Mean and Range

[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, $\mu$ -hat	34.840
Process St.Dev., $\sigma$ -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 $CL-k\sigma_{X\text{-bar}}$
$\alpha$	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

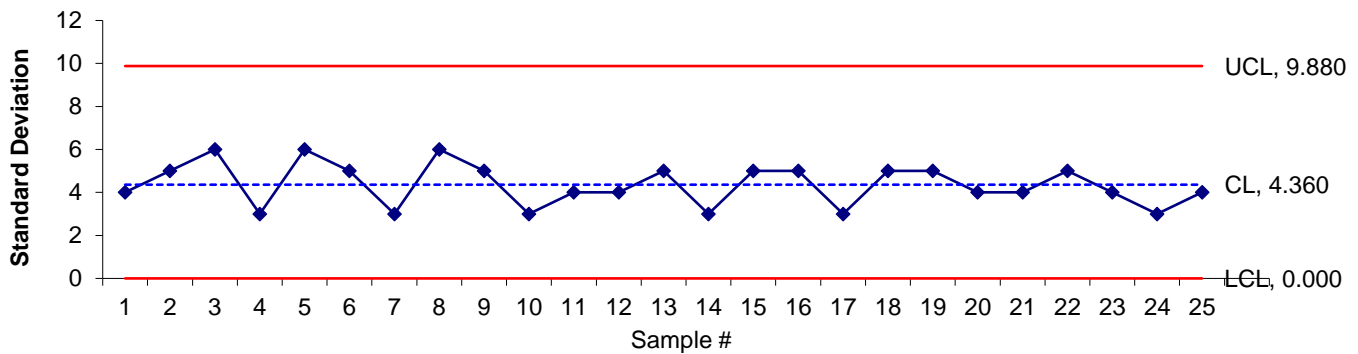
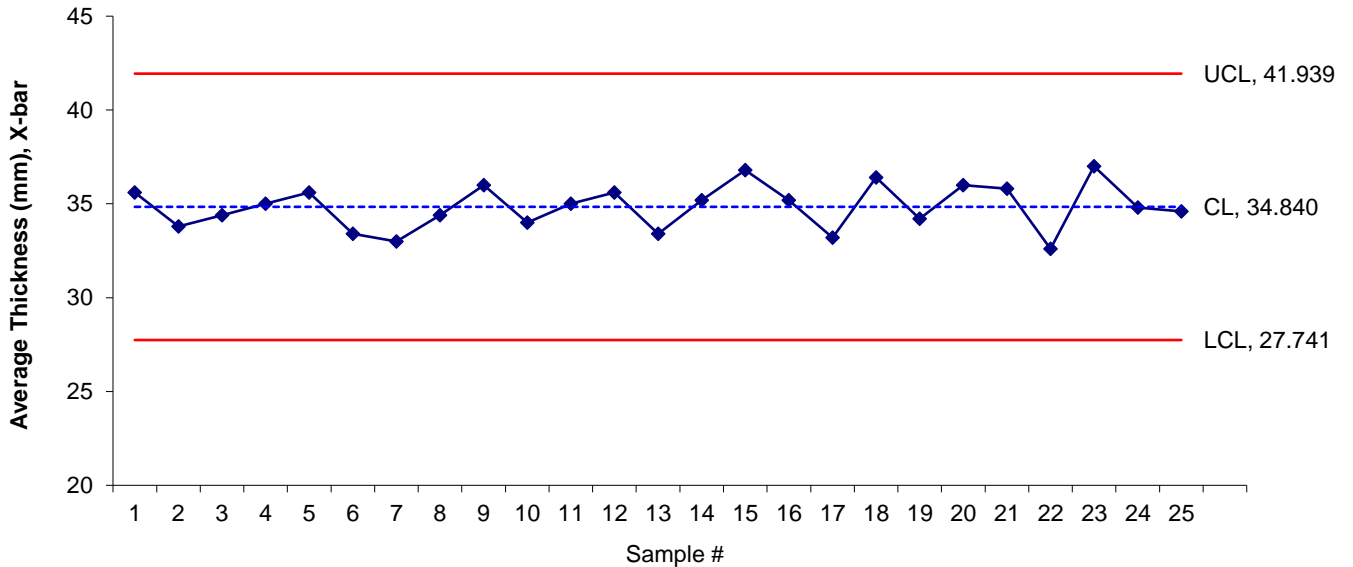
Sample Size,  $n$

$k$

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
$\sigma_s$	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
$\alpha$	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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