X Bar- Chart

This chart is used to control mean of produced product. The central line is (T=$\bar{\bar{x}}$) , the sum of a number of sample mean divided by the number of samples.

$$\bar{\bar{x}} = \frac{\sum_{j=1}^{m} \bar{x}_j}{m}$$

Where:

$\bar{\bar{x}}$ = Average of the sample mean.

$\bar{x}_j$= Average of the subgroup.

m = Number of samples (subgroup)

control limits for xbar charts is

$$UCL = \bar{\bar{x}} + 3\hat{\sigma}_{\bar{x}} = \bar{\bar{x}} + A_2\bar{R}$$

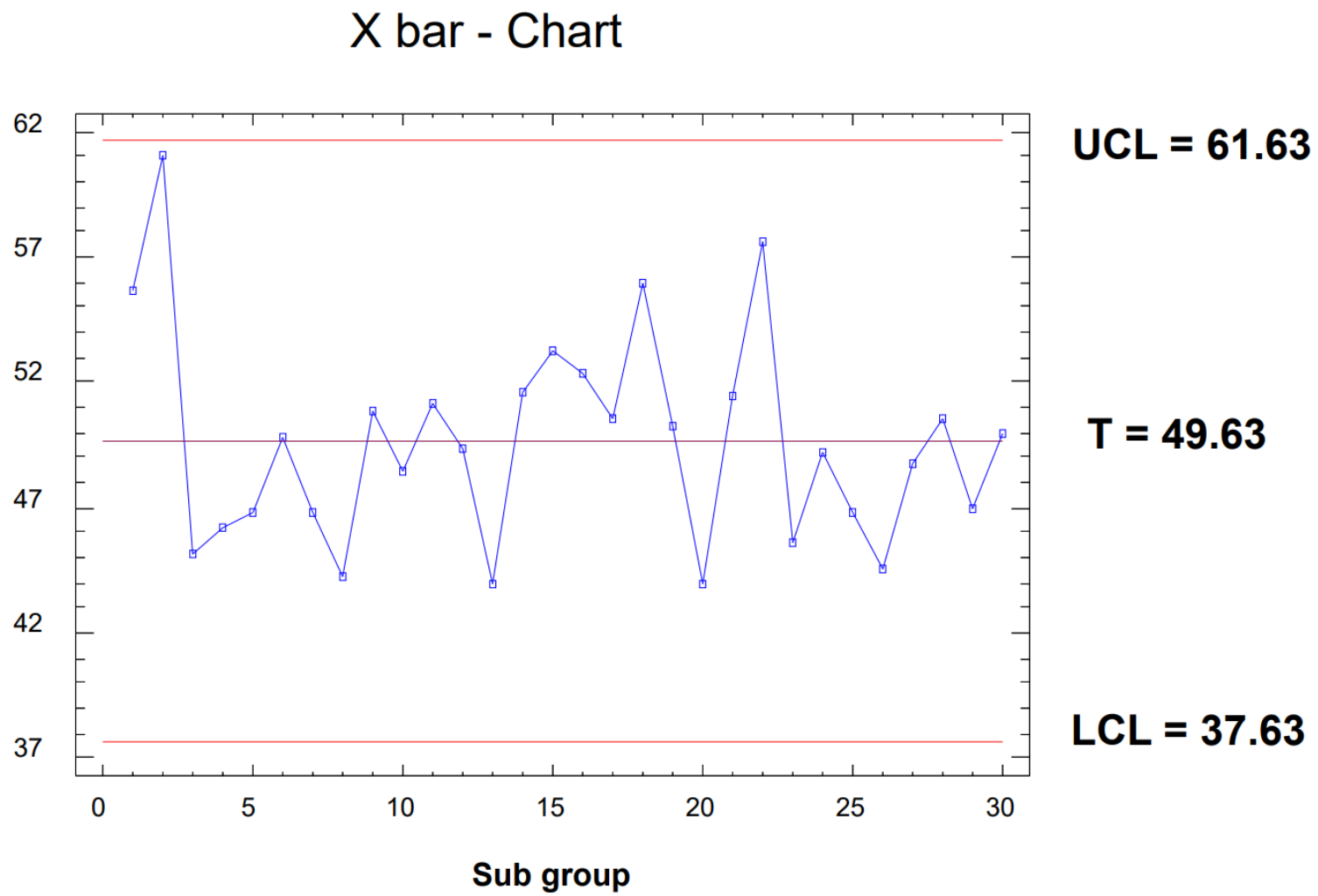
$$LCL = \bar{\bar{x}} - 3\hat{\sigma}_{\bar{x}} = \bar{\bar{x}} - A_2\bar{R}$$

$$\hat{\sigma}_{\bar{x}} = \sqrt{\frac{\sum_{i=1}^{m} \bar{x}_i^2 - m\,\bar{\bar{x}}^2}{(m-1)}}$$

Where: (A2)The constant is tabulated value and dependent on SAMPLE SIZE

EX: draw X-bar chart .

Sample	X-bar	Sample	X-bar	Sample	X-bar
1	55.6	11	51.2	21	50.0
2	61.0	12	49.4	22	47.0
3	45.2	13	44.0	23	50.6
4	46.2	14	51.6	24	48.8
5	46.8	15	53.2	25	44.6
6	49.8	16	52.4	26	46.8
7	46.8	17	50.6	27	49.2
8	44.2	18	56.0	28	45.6
9	50.8	19	50.2	29	57.6
10	48.4	20	44.0	30	51.4


X bar - Chart
62
57
52
47
42
37
0
5
10
15
20
25
30
Sub group
UCL = 61.63
T = 49.63
LCL = 37.63