

Let me repeat that another way. A Gaussian curve allows us to use mean and SD to create Levey-Jennings charts that we can use to set up control charts. If the distribution is not Gaussian, then we must use non-linear statistical systems, or some other data transformation system to successfully use control charts. As this is relatively unusual, we will ignore it until a later module of this course, and proceed to discuss charts where the result distribution is Gaussian.

Now we are ready to do some stats calculations, beginning with the mean. The mean of all the values, including the 'outlier' works out to 123.3 – check it out using the system shown earlier. If we remove the outlier of 129, the mean of the 19 results left now becomes 123.0, a very similar value to the previous mean.

Is it justified to exclude this apparent outlier? There are systems to identify outliers statistically, and one will be discussed and presented in a later module, but for the moment, let's look at the mean and SD with and without the outlier before deciding.

After the mean comes the SD. The SD when all the results are included is 2.0 While the SD for the trimmed data, when the outlier is excluded, is markedly different, at 1.5.

The differences have significance for your use of these figures to set up a control chart and decide if your subsequent control runs are acceptable or not.

When using all the data, the mean is 123.3 (remember, one decimal point more than you use routinely) and the +/- 2 SD range is +/- (2 x 2.0), that is 4.0. That means that your control chart will look like this:

+ 2 SD-----	127.3
+ 1 SD-----	125.3
Mean -----	123.3
- 1 SD-----	121.3
- 2 SD-----	119.3

Before presenting the second chart, with the outlier excluded, let's examine the implications of using this chart.

By using the calculations for working out SD, it is implicit that 95% of results will be inside the range covered by +/- 2 SDs; and about 68% of results will be inside the range covered by +/- 1 SD. Simply put, that is the reason why you MUST work out and use