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OISM 470W

Spring 2001

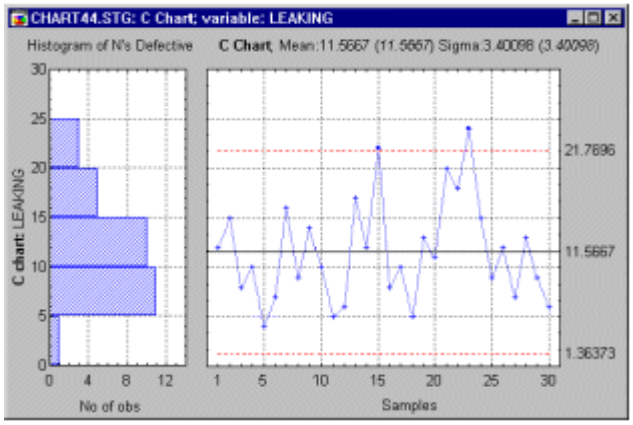
C Charts

The C Chart is a very important tool in the business world, and plays a key role in product production. A C Chart is a chart that measures the amount of defects in a production line per unit. These units can either be “per batch”, “per length”, or some other type of rate. The C Chart is one of four control charts used in quality control. In a C Chart the number of times a condition occurs is monitored, relative to the sample size.

C Charts are set up on a graph, using an upper control limit (UCL) and a lower control limit (LCL). These control limits, represented as horizontal lines, along with the points in between, will be across the y-axis. A simple formula for setting up your control limits is: UCL or LCL = C +[3 ^ the square of 3], where C is the average number of defects. To get C, take the total number of defects and divide that number by the amount of products you have. On the x-axis will be the number of samples taken. After this, the samples can be plotted on the chart corresponding to their measurement to the y-axis. After the sample is complete, the points can be connected and a conclusion can be drawn.

The points that fall outside of the UCL and LCL horizontal lines are know to be out of control and the points that fall between the control limits are know to be in control. Knowing if your process is in control or out of control is vital to production. Even if a few points fall outside of the control limits your process may still be in control. This deals with random variation.

Random variation just means that there might have been an isolated problem that occurred once, or some other type of error, which forced the sample out of the control limit. Random variation is common and can be expected in C Charts. On the other hand, if you have a constant amount of samples falling outside of the control limits your process is almost definitely out of control. Out of control processes are a hindrance to production by producing lower quality standards as well as being very costly. If an out of control process is detected, go through your production and isolate out the problem until your process is in control. A typical C Chart with UCL, LCL, and samples plotted is very simple to create and is similar to this:



Using C Charts as well as other control charts is a form of acceptance sampling. Acceptance sampling is a new approach to inspection. Instead of using 100% inspection, or inspecting each item of the production lot for quality. Acceptance sampling uses the C Chart to gather the information for you. This process is much less time consuming, leads to less scrap and rework, and is far less expensive than 100% inspection.

C Charts are being used more and more in companies today. To better compete in the market place, costs need to be cut and quality has to be raised. To do this many companies are modernizing their inspection process. For example: A birdhouse company XYZ use 100% inspection to check the quality of all their birdhouses. This process requires 10 seconds out of a 60 second production time. It also requires an extra inspector to check each house at the end of the process. By switching to using C Charts to check their processes, XYZ will greatly benefit. Production times will be cut down by $1/6^{th}$ and a lower over head will be achieved through the termination of the extra inspector at the end of the process. Using C Charts puts the power of the inspection in the hands of the management instead of the personnel, and can be easily calculated by computer. XYZ will be able to offer a lower cost birdhouse and still retain a high level of quality.

To gain more in-depth understanding of C Charts, as well as acceptance sampling, control charts and other forms of quality inspection. There are web sites based solely on these applications. Many can just be found using your Internet explorer. Also there are several publications on each of the topics, which can be found in local libraries across the world. A better understanding of the inspection process and C Charts in general will not only help your company compete in the ever changing market place; but allow you to deliver your product at a lower cost, and at a higher quality which will place your company above all others and guarantee you the sale.

Bibliography

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