# Q-QUIZ JULY 2018 - ANSWERS
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**The success of capability analyses often depends on how sensitive quality control charts are. As an example, you conduct a process capability analysis for a groove depth of 10.2 ± 0.06. The result is a normally distributed process where $C_p$ = 1.69 and $C_{pk}$ = 1.43. Use this information to calculate a Shewhart control chart for median and standard deviation. The sample size amounts to 5 and the control limits are based on a random variation range of 99.73%.**

1. After you changed a tool, you set the machine to the tolerance centre again. The next five subgroup averages are above the tolerance centre. This might, however, be a coincidence. You have to keep an eye on it.

2. After a sudden bearing damage in the engine of the milling cutter, the variation increases by a factor of 1.5. The increase shows that one of the next 10 averages is likely to exceed the control limits.

3. After you repaired the bearing, you start a machine performance study leading to $C_m$ = 2. You set the machine to the tolerance centre again, reduce the amount of inspection and inspect only one out of 50 parts. It is, however, hard to detect that the standard deviations doubles now, even though this is likely to lead to rejects of about 3000 ppm.

4. You use a plastics injection moulding procedure to produce a distributor whose unit weight indicates a zero-defect production. The unit weight, however, varies between the synthetic granules' different batches of material. The variation remains constant. To control the process, you use a Shewhart control chart with expanded control limits for monitoring the location. The control limits of the variation chart remain the same since they are more sensitive and better indicate a change in unit weight.