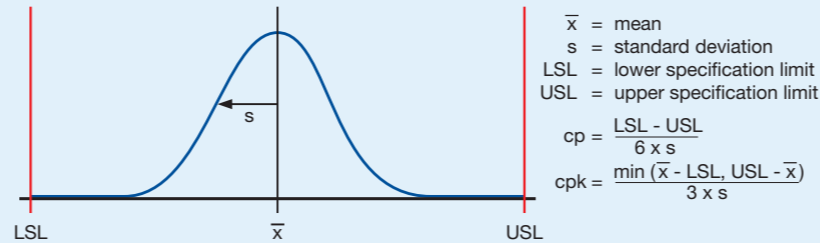




SIX SIGMA: Definitions and Terms

cp: this process capability index shows the ratio between the specified spread and the actual spread of a process.

cpk: this process capability index indicates the potential of a process to meet its specification. The higher the value, the more likely the entire production lies within specification. A cpk of at least 1.3 is desirable for a well-controlled process. A SIX SIGMA process exhibits a cpk of 2.



DMAIC

DMAIC: abbreviation for the five phases of the SIX SIGMA problem-solving method: Define, Measure, Analyse, Improve and Control.

Poka Yoke: Japanese term which stands for mistake-proofing. The technique involves preventing errors by taking simple yet imaginative measures or by recognising errors at the point of occurrence.

ppm: abbreviation for parts per million. By the same token that one percentage (%) point is one hundredth, one ppm is one millionth. We use ppm when measuring the error/defect rate of a process:

$$\text{Error rate} = \frac{\text{number of defects}}{\text{number of defect opportunities}} \times 1000000$$

A SIX SIGMA process exhibits an error rate of 3.4 defects per million defect opportunities

SCO: safety, cleanliness and order form the basis of excellent process quality. Safety representatives and process managers make regular tours to monitor the actual state of safety, cleanliness and order. Results are then evaluated and improvements are implemented.



For more details of SCHURTER's Quality Management System, visit www.schurter.com

Rolf Nussbaumer, Quality Management Manager, looks forward to answering any questions you may have: rolf.nussbaumer@schurter.ch

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My Personal Contribution to SIX SIGMA

I know what is expected of my process. I am familiar with the requirements of the internal and external customers.

I am familiar with the measurements that show how well my process meets requirements.

I respond to deviations by taking corrective measures and tracking their progress.

I collaborate with the owners of the upstream and downstream processes.

I inform my line manager of any serious or recurring deviations.

I participate constructively in improvement teams and contribute creative and innovative ideas to solve problems and make improvements.

I am familiar with and utilise the DMAIC problem-solving method in order to:

- determine the cause of a deviation
- take effective corrective measures
- achieve continual improvement



SCHURTER distinguishes itself through the excellent quality of its processes. The SIX SIGMA methods enable us to enhance customer benefit and strengthen our market position on a continuous basis.

We base our decisions on **data and facts**. We identify the needs of our customers, measure process output, analyse results and take corrective action.

We deploy SIX SIGMA's **systematic problem-solving method** DMAIC to improve our processes. At the same time, we also systematically eliminate waste of any kind.

The successes we achieve through SIX SIGMA are real and tangible. We gain new knowledge, insights and experiences and encourage others to participate.



Define	Measure	Analyze	Improve	Control
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Activity Describing the problem and the improvement goal <ul style="list-style-type: none"> What is the cause? What is the problem? What is the goal? How do we know the goal has been achieved? 	Collecting data and facts to identify the actual situation and to become familiar with the process <ul style="list-style-type: none"> How is the process defined? What is influencing the process? What outputs does the process yield? 	Identifying influencing factors based on the data and facts. Determining how the main factors influence the process <ul style="list-style-type: none"> Identify possible causes Identify root causes Establish cause/effect relationships 	Finding solutions to eliminate the effect of the impacts and thereby improve the process <ul style="list-style-type: none"> Identify opportunities for improvement Plan and implement tests Implement and measure process improvements 	Facilitating continual improvement so as to achieve long-term process improvement <ul style="list-style-type: none"> Document the improvement Inform stakeholders Initiate process verification
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Result The problem, the goal and the success criteria have been defined clearly and concisely	A concise process description has been established	The influencing factors have been determined and their impact on the process is known	Measures to make continual improvements to the process have been introduced	A profoundly improved, controlled and verified process has been established
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Tools <ul style="list-style-type: none"> Action plan, minutes of meetings Cost-benefit calculation 	<ul style="list-style-type: none"> Action plan, minutes of meetings SIPOC process flow diagram Measurement list Measurement system capability Process control chart Histogram Run chart 	<ul style="list-style-type: none"> Action plan, minutes of meetings Brainstorming Fishbone/Ishikawa diagram (Process-) FMEA, Fault Tree 5 x why Test planning Hypothesis test 	<ul style="list-style-type: none"> Action plan, minutes of meetings Brainstorming Poka Yoke (Process-) FMEA Process control chart Histogram Run chart Before/after analysis 	<ul style="list-style-type: none"> Action plan, minutes of meetings Yield/savings evidence Work and test instruction Process visualisation and monitoring Poka Yoke measures Tool/robotics modifications Automation Design changes
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Check Questions <ul style="list-style-type: none"> Has the problem been defined clearly and concisely? Have neither cause nor solution been anticipated? Is the target clearly described? Have the metrics been determined? Has a target value to be achieved been determined? 	<ul style="list-style-type: none"> Has the problem been defined clearly and concisely? Have all functions and sub-processes involved been taken into account? Is the actual situation supported by data? Is the data meaningful? Is the measuring method reliable? 	<ul style="list-style-type: none"> Has the data been thoroughly explored? Have all possible causes/impacts been identified? Have the root causes been identified based on data and facts? 	<ul style="list-style-type: none"> Have various solutions been identified? Have meaningful tests been conducted? Is the improvement verified and effective? 	Will the improvements introduced have a continual effect? <ul style="list-style-type: none"> Has improvement verification been initiated? Have all stakeholders been informed of the changes? Are the experiences gained also available to third parties?
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