

Measurement System Analysis with Q-DAS solara.MP

MSA is an experimental mathematical method that determines how much of the total variation observed is due to the measurement system itself. It helps us to determine the ways in which a measurement system needs to be improved. Measurement System Analysis (MSA) is a first step that should precede any decision, including the use of Statistical Process Control.

There are many software used for statistical processing of data. The most used so far is MINITAB.

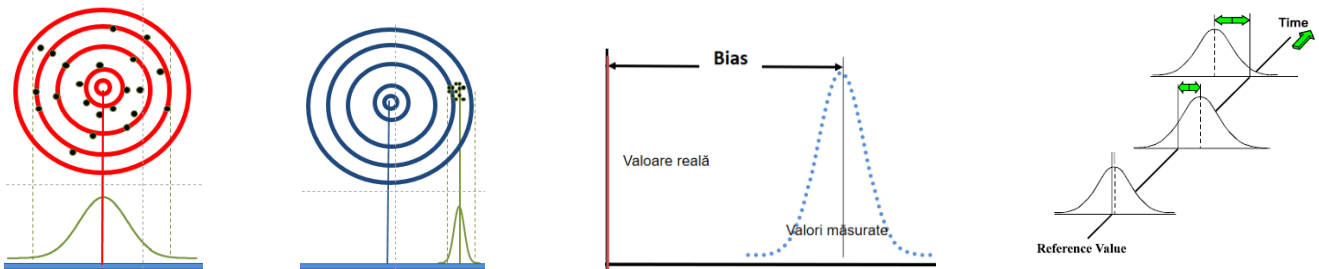
In the last period, due to several customers in the automotive industry in Germany has developed and required the use of Q-DAS.



Version used for measurement system analysis is solara.MP. Solara.MP provides the complete tool kit to evaluate the measuring systems and processes that are used for statistical analysis of manufacturing processes. To ensure that the measurements are reliable - reflecting actual and existing conditions - the measurement processes must be verified and qualified as trustworthy. solara can carry out the necessary capability studies for measurement system, to eliminate the risk of misinterpretation of the collected data.

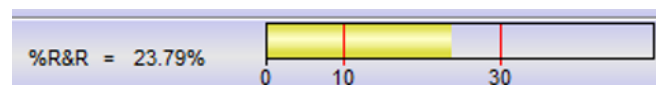
The most important concepts used in MSA are:

1. Accuracy
2. Precisin
2. Bias
4. Stability



Repeatability - evaluate whether the same inspector can measure the same sample several times with the same tool and get the same value;

Reproducibility - evaluate whether more inspectors can measure the same sample the same instrument and get the same value.



Gage R & R - Indicates the percentage of the total variation that is taken from measurement error and provides an assessment of repeatability (caused by the instrument) and reproducibility (caused by inspectors).

Repeatability	%EV = 17.62%	<div style="width: 17.62%; background-color: yellow;"></div>	59
Reproducibility	%AV = 14.81%	<div style="width: 14.81%; background-color: yellow;"></div>	02
Interaction	%IA = 23.17%	<div style="width: 23.17%; background-color: yellow;"></div>	73
Repeatability & Reproducib	%R&R = 32.66%	<div style="width: 32.66%; background-color: red;"></div>	66

Solara.MP presents visual representative graphics with which we can evaluate the errors of the measuring system (see figure below).

If major errors come from repeatability then the equipment must be replaced, repaired or calibrated. If reproducibility is the dominant source then must be considered inspectors or operators which measure training or procedures / instructions that manage this process.

