

## Risks of a false decision on conformity of a multicomponent material and quality of chemical analytical results

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Comparing chemical analytical (test) results with the material specification, regulatory or acceptance limits of the component content, one should decide whether the tested sample (batch/lot) conforms or not. It is known that measurement uncertainty, which characterizes the quality of a result, leads to risks of false decisions. Evaluation of

such risks for a multicomponent material or object involves calculation of probabilities of false decisions for the different components of the material or object (particular consumer's and/or producer's risks). At the same time, even when conformity assessment for each component of a sample is successful, the total probability of a false decision (total consumer's risk or producer's risk) on the conformity of the sample as a whole may still be significant. The total risk due to measurement uncertainty can be evaluated as a combination of the particular risks of conformity assessment of the sample components, whenever there is independence among their test results. Possible correlation can be viewed as a further quality parameter of the results, influencing the total risk of false decisions. It should be also taken into account at the risk evaluation.

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