

Simplified Method for Uncertainty Evaluation in Calibration and Tests

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Everywhere when measurements are carried out they are expected to have unambiguous, comparable, precise and reliable results. The comparability, reliability and recognition of the results are achieved, first of all, by applying the instruments calibrated, the uncertainty of which has been evaluated on the basis of some known recognized methods.

Until recently a great number of calibration and testing laboratories have faced significant problems in applying the ISO Guide to the expression of uncertainty in measurement and the corresponding document EA-04/02 (Expression of Uncertainty of Measurement in Calibration) issued by the European cooperation for Accreditation. On the other hand, many measurement problems can be solved by using of a simplified method of uncertainty calculation.

The measurand is frequently determined as a sum (the difference) or in the form of a product (a ratio) of input values. In these cases it is possible to indicate the simple equations for standard uncertainty, which comprise the square root of the sum of squared absolute or relative standard uncertainties of input values. This method can be applied even for complex model functions if the model function can be split into a sum (difference) or product (ratio) of separate functions in appropriate manner.

Application of the above approach is illustrated using the examples, which occur frequently in practice.