INTERNATIONAL STANDARD

ISO 8466-2

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Water quality — Calibration and evaluation of analytical methods and estimation of performance characteristics —

Part 2:
Calibration strategy for non-linear second order calibration functions

Qualité de l'eau — Étalonnage et évaluation des méthodes d'analyse et estimation des caractères de performance —

Partie 2: Stratégie d'étalonnage pour fonctions d'étalonnage non linéaires du second degré

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Contents

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

International Standard ISO 8466-2 was prepared by Technical Committee ISO/TC 147, *Water quality*, Sub-Committee SC 7, *Precision and accuracy*.

ISO 8466 consists of the following parts, under the general title *Water quality — Calibration and evaluation of analytical methods and estimation of performance characteristics*:

— *Part 1: Statistical evaluation of the linear calibration function*

— *Part 2: Calibration strategy for non-linear second order calibration functions*

— *Part 3: Method of standard addition*

— *Part 4: Estimation of limit of detection and limit of determination of an analytical basis method*

Annex A forms an integral part of this part of ISO 8466. Annex B is for information only.

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Water quality — Calibration and evaluation of analytical methods and estimation of performance characteristics —

Part 2:
Calibration strategy for non-linear second order calibration functions

1 Scope

It is not always possible to accurately describe the relationship between a set of calibration points with a rectilinear curve, even by decreasing the working range. Instead of the linear regression analysis, a least squares fit to a second order polynomial is applied (see test for linearity in 4.1.3 of ISO 8466-1:1990). Using this, it is possible to calculate not only the calibration function but also the confidence interval associated with it.

This part of ISO 8466 is intended primarily for use in method development and may not necessarily be applicable to all routine analyses.

2 Symbols

x_i	Concentration of the ith standard sample.
i	Subscript of the concentration levels, where $i = 1, 2, ..., N$.
N	Number of concentration levels (for this part of ISO 8466, $N = 10$).
x_1	Concentration of the standard sample at the lower level of the working range (1st standard sample).
x_{10}	Concentration of the standard sample at the upper level of the working range (10th standard sample).
$y_{i,j}$	j th information value for the concentration x_i.
j	Subscript of the replicates of level i, where $j = 1, 2, ..., n_i$.
n_i	Number of replicates per level x_i.
$\bar{y}_i$	Mean of the information values $y_{i,j}$ of standard samples, having the concentration x_i.
s_i^2	Variance of the information values for the analyses of standard samples, having the concentration x_i.
PW	Test value for the F-test.
$F(f_1, f_2, P)$	Tabled value of the F-distribution with f_1 and f_2 degrees of freedom and a confidence level of P (%).
a, b, c	Coefficients of the calibration function.
$\bar{x}$	Mean of the standard concentrations x_i, resulting from the calibration experiment.