INTERNATIONAL STANDARD

ISO 8466-2

Second edition
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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

Page

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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 3.

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.

Attention is drawn to the possibility that some of the elements of this part of ISO 8466 may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

International Standard ISO 8466-2 was prepared by Technical Committee ISO/TC 147, *Water quality*, Subcommittee SC 2, *Physical, chemical, biochemical methods*.

This second edition cancels and replaces the first edition (ISO 8466-2:1993), which has been technically revised.

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*

Annex A forms an integral part of this part of ISO 8466.

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[1]). Using this fit, 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

a, b, c	Coefficients of the calibration function
E	Instrument sensitivity in the centre of the working range
e	Instrument sensitivity, defined as the first derivative of the calibration function
$F(f_1, f_2, P)$	Tabled value of the F-distribution with f_1 and f_2 degrees of freedom and a confidence level of P (%)
F_{calc}	Test value calculated for the F-test
f	Number of degrees of freedom for the residual standard deviation ($f = N - 3$)
$I(\hat{x})$	Confidence interval for the concentration $\hat{x}$
i	Subscript of the concentration levels, where $i = 1, 2, ..., N$
j	Subscript of the replicates of level i, where $j = 1, 2, ..., n_i$
N	Number of concentration levels (for this part of ISO 8466, $N = 10$)
$\hat{N}$	Number of replicates for the same analytical sample
n_i	Number of replicates per level x_i
s_{xo}	Standard deviation of the procedure