

ISO/TS 21748:2004-03 (E)

Guidance for the use of repeatability, reproducibility and trueness estimates in measurement uncertainty estimation

Contents		Page
Foreword		iv
Introduction		v
1	Scope	1
2	Normative references	1
3	Terms and definitions	2
4	Symbols	4
5	Principles	7
5.1	Individual results and measurement process performance	7
5.2	Applicability of reproducibility data	7
5.3	Basic equations for the statistical model	7
5.4	Repeatability data	8
6	Evaluating uncertainty using repeatability, reproducibility and trueness estimates	8
6.1	Procedure for evaluating measurement uncertainty	8
6.2	Differences between expected and actual precision	9
7	Establishing the relevance of method performance data to measurement results from a particular measurement process	9
7.1	General	9
7.2	Demonstrating control of the laboratory component of bias	9
7.3	Verification of repeatability	11
7.4	Continued verification of performance	12
8	Establishing relevance to the test item	12
8.1	General	12
8.2	Sampling	12
8.3	Sample preparation and pre-treatment	13
8.4	Changes in test-item type	13
8.5	Variation of uncertainty with level of response	13
9	Additional factors	14
10	General expression for combined standard uncertainty	14
11	Uncertainty budgets based on collaborative study data	15
12	Evaluation of uncertainty for a combined result	16
13	Expression of uncertainty information	17
13.1	General expression	17
13.2	Choice of coverage factor	17
14	Comparison of method performance figures and uncertainty data	17
14.1	Basic assumptions for comparison	17
14.2	Comparison procedure	18

14.3	Reasons for differences	18
	Annex A (informative) Approaches to uncertainty estimation	19
	Annex B (informative) Experimental uncertainty evaluation	24
	Annex C (informative) Examples of uncertainty calculations	25
	Bibliography	29