

ISO/TS 23471:2022-11 (E)

Experimental designs for evaluation of uncertainty - Use of factorial designs for determining uncertainty functions

Contents		Page
Foreword		iv
Introduction		v
1	Scope	1
2	Normative references	1
3	Terms and definitions	1
4	Symbols	3
5	General principles	5
5.1	General	5
5.2	Principles of conventional approach	5
5.3	Principles of factorial approach	5
6	Conventional approach	5
6.1	General considerations	5
6.2	Selection of samples and levels	5
6.3	Experimental design	6
6.4	Statistical analysis	6
6.4.1	Statistical model	6
6.4.2	Calculation of in-house repeatability and in-house reproducibility	7
6.4.3	Calculation of measurement uncertainty	8
7	Factorial approach	9
7.1	General considerations	9
7.2	Selection of sample materials, factors and factor levels	10
7.3	Experimental design	10
7.4	Statistical analysis	10
7.4.1	Statistical model	10
7.4.2	Calculation of in-house repeatability and in-house reproducibility	11
7.4.3	Calculation of measurement uncertainty	13
Annex A (informative)	REML estimation	14
Annex B (informative)	Orthogonal design with 8 factor level combinations for 7 factors with 2 factor levels	15
Annex C (informative)	Orthogonal design with 12 factor level combinations for 3 factors with 2 factor levels and 1 factor with 3 factor levels	17
Annex D (informative)	Orthogonal design with 9 factor level combinations for 4 factors with 3 factor levels	19
Annex E (informative)	Asymmetric measurement uncertainty interval	21
Annex F (informative)	Example	22
Bibliography		26