ISO 33403:2024-06 (E)

Reference materials - Requirements and recommendations for use

Contents

Page

Foreword ..... **iv**

Introduction ..... **v**

1 Scope **1**

2 Normative references **1**

3 Terms and definitions **1**

4 Symbols **2**

5 Conventions **2**

6 RMs and their role in measurement **3**
6.1 Common applications of RMs 3
6.2 Property values 5
6.2.1 General 5
6.2.2 Specification of the property 5
6.3 Uncertainty statement 6
6.4 Traceability statement 7

7 Handling of RMs and CRMs **8**

8 Assessment of precision **8**
8.1 General 8
8.2 Number of replicate measurements 9
8.3 Requirements with respect to the RM 9
8.4 Measurement 10
8.5 Data treatment 10
8.6 Calculation and assessment of precision 11

9 Bias assessment **11**
9.1 General 11
9.2 Approach to bias checking 12
9.3 Utilizing bias data 12

10 Calibration **13**
10.1 General 13
10.2 Practical considerations for calibration 13
10.3 Calibration models 14

11 Assigning values to other materials **14**
11.1 General 14
11.2 Pure substances 15
11.3 Preparation of calibrants 16

12 Conventional scales **16**

13 Selection of RMs and CRMs **18**
13.1 General 18
13.2 Selection of a CRM 18
13.3 Selection of RMs 19
13.4 Relevance to the measurement system 20

Annex A (informative) **Calibration models and associated uncertainty models** **21**

Annex B (informative) **Decision errors** **24**

Annex C (informative) **Example of conventional scales** **25**

Bibliography **26**