

ISO 17511:2020-04 (E)

In vitro diagnostic medical devices - Requirements for establishing metrological traceability of values assigned to calibrators, trueness control materials and human samples

Contents		Page
Foreword		vi
Introduction		viii
1	Scope	1
2	Normative references	2
3	Terms and definitions, symbols and abbreviated terms	2
4	General requirements to be fulfilled by a manufacturer for establishing, validating and documenting metrological traceability of human sample values determined with a specified IVD MD	19
4.1	Requirements for documenting metrological traceability of measured quantity values	19
4.2	Definition of the measurand	19
4.3	Specifications for maximum allowable expanded measurement uncertainty, $U_{max}(y)$	20
4.3.1	General requirements	20
4.3.2	Scope of the specification	20
4.4	Defining the calibration hierarchy	20
4.4.1	General requirements	20
4.4.2	Measured quantity	21
4.4.3	Highest level of metrological traceability	21
4.4.4	Traceability to SI	21
4.4.5	Non-SI traceable IVD MDs	21
4.4.6	Number of levels in the specified hierarchy	21
4.5	Selection and requirements for RMs and calibrators	21
4.5.1	General requirements	21
4.5.2	Characteristics to be documented	21
4.5.3	Higher order RMs that conform with ISO 15194	22
4.5.4	RMs not conforming to ISO 15194	22
4.5.5	Commutability of RMs	22
4.5.6	Exception to commutability assessment requirements	23
4.5.7	Application of a non-commutable CRM	23
4.5.8	Alternative RMs	23
4.5.9	Augmentation of alternative RMs	23
4.5.10	Non-commutable end-user IVD MD calibrators	24
4.6	Selection and requirements for MPs	24
4.6.1	Rationale for selection of MPs and documentation responsibility	24
4.6.2	Metrological status of MPs	24
4.6.3	Reference measurement laboratories	24
4.6.4	Impact of influence quantities	25
4.6.5	Changes in the measured quantity within a calibration hierarchy	25
4.7	Estimating uncertainty of assigned values for end-user IVD MD calibrators	25
4.7.1	General requirements	25
4.7.2	Documentation for method of estimating u_{cal}	26
4.7.3	Statistical considerations and scope of u_{cal} estimates	26
4.7.4	Expression of u_{cal}	26
4.7.5	Product modifications	27
4.7.6	Information to be provided to the end-user	28
4.8	Validation of metrological traceability of values assigned to an IVD MD calibrator	28
4.8.1	General validation requirements	28
4.8.2	Validation strategies	28

4.8.3	Test design considerations and acceptance criteria	29
4.8.4	Calibration hierarchies with an available RMP	29
4.8.5	Calibration hierarchies with no available RMP	29
4.8.6	Calibration hierarchies with no RMPs and no CRMs	29
4.8.7	Validation of design changes to an end-user IVD MD calibrator	30
4.9	Additional calibration hierarchy documentation responsibilities	30
4.9.1	Obligation to end-users	30
4.9.2	Maintaining documentation	30
4.9.3	Third party manufacturers of IVD MD calibrators	30
4.9.4	Modifications introduced by independent entities	30
4.9.5	Calibration hierarchies supporting IVD MDs developed by a single entity for its own use	31
4.9.6	RMs other than end-user IVD MD calibrators	31
4.9.7	EQA and PT materials with claims of metrologically traceable target values	31
5	Model calibration hierarchies for metrological traceability	31
5.1	Elements of the description of a calibration hierarchy	31
5.2	Cases with RMPs and primary RMs	32
5.2.1	General considerations	32
5.2.2	Definition of the measurand	33
5.2.3	Selecting RMPs	34
5.2.4	Primary RMPs	34
5.2.5	Primary calibrators	35
5.2.6	Assigning a value to a secondary RM or calibrator	35
5.2.7	Commutability of secondary RMs	35
5.2.8	Manufacturer's Selected MP	35
5.2.9	Working calibrators	35
5.2.10	Manufacturer's standing MP	36
5.2.11	Manufacturer's end-user calibrator	36
5.2.12	u_{cal} of the assigned value of the end-user calibrator	36
5.2.13	End-user IVD MD	36
5.3	Cases with a primary RMP that defines the measurand	36
5.3.1	General Considerations	36
5.3.2	Definition of the measurand	38
5.3.3	Higher order RMP that defines the measurand	38
5.3.4	The primary RMP and definition of the measurand	38
5.3.5	Documentation of the primary RMP	38
5.3.6	Assignment of values to secondary RMs	39
5.3.7	Manufacturer's selected MP	39
5.3.8	Manufacturer's working calibrator	39
5.3.9	Manufacturer's standing MP	40
5.3.10	Manufacturer's end-user calibrator	40
5.3.11	End-user IVD MD	40
5.4	Cases for measurands defined by a RMP calibrated with a particular primary calibrator	40
5.4.1	General considerations	40
5.4.2	Definition of the measurand	41
5.4.3	Value assignment of the primary RM	42
5.4.4	Value assignment of the primary calibrator	42
5.4.5	Selection and intended use of the RMP in the calibration hierarchy	42
5.4.6	Manufacturer's selected MP	42
5.4.7	Manufacturer's working calibrator	42
5.4.8	Manufacturer's standing MP	43
5.4.9	End-user IVD MD calibrator	43
5.4.10	End-user IVD MD	43
5.5	Cases with an international conventional calibrator that defines the measurand	43
5.5.1	General considerations	43
5.5.2	The international conventional calibrator — Material description	45
5.5.3	Value assignment of an international conventional calibrator	45
5.5.4	Commutability of an international conventional calibrator	45
5.5.5	Calibration and selection of the manufacturer's selected MP	46
5.5.6	Characteristics and value assignment of the manufacturer's working calibrator	46
5.5.7	Manufacturer's standing MP	46
5.5.8	End-user IVD MD calibrator	46
5.5.9	End-user IVD MD	46

5.6	Cases with metrological traceability supported by an international harmonisation protocol.....	46
5.6.1	General Considerations.....	46
5.6.2	International harmonisation protocol.....	47
5.6.3	Assignment of values to harmonisation RMs.....	48
5.6.4	Application of harmonisation RMs.....	48
5.6.5	End-user IVD MD.....	48
5.7	Cases for measurands with metrological traceability only to manufacturer's internal arbitrarily defined RM(s).....	48
5.7.1	General considerations.....	48
5.7.2	Selection of RMs.....	49
5.7.3	Manufacturer's Selected MP.....	50
5.7.4	Manufacturer's Standing MP.....	50
5.7.5	End-user IVD MD calibrators.....	50
5.7.6	End-user IVD MD.....	50
5.7.7	Documentation of the calibration hierarchy.....	50
6	Labelling information to be provided to end-users by the manufacturer.....	51
	Bibliography.....	52