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Instructions on how to use the DCC schema to create a digital calibration certificate for weights

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Deutscher Kalibrierdienst (DKD) – **German Calibration Service**

Since its foundation in 1977, the German Calibration Service has brought together calibration laboratories of industrial enterprises, research institutes, technical authorities, inspection and testing institutes. On 3rd May 2011, the German Calibration Service was reestablished as a *technical body* of PTB and accredited laboratories.
This body is known as *Deutscher Kalibrierdienst* (DKD for short) and is under the direction of PTB. The guidelines and guides developed by DKD represent the state of the art in the respective areas of technical expertise and can be used by the *Deutsche Akkreditierungsstelle GmbH* (the German accreditation body – DAkkS) for the accreditation of calibration laboratories.
The accredited calibration laboratories are now accredited and supervised by DAkkS as legal successor to the DKD. They carry out calibrations of measuring instruments and measuring standards for the measurands and measuring ranges defined during accreditation. The calibration certificates issued by these laboratories prove the traceability to national standards as required by the family of standards DIN EN ISO 9000 and DIN EN ISO/IEC 17025.

Contact:
Physikalisch-Technische Bundesanstalt (PTB)
DKD Executive Office
Bundesallee 100 38116 Braunschweig
P.O. Box 33 45 38023 Braunschweig
GERMANY
Telephone: +49 531 592-8021
Internet: www.dkd.eu

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Authors:

Dr.-Ing. Gisa Foyer, Physikalisch-Technische Bundesanstalt, Braunschweig, Germany
Dr. Julian Haller, Sartorius Lab Instruments GmbH & Co. KG, Göttingen, Germany
Christian Müller-Schöll, Mettler-Toledo Int. Inc., Greifensee, Switzerland
Steffen Osang, Minebea Intec Bovenden GmbH & Co. KG, Bovenden, Germany
Alexander Scheibner, Physikalisch-Technische Bundesanstalt, Braunschweig, Germany

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Foreword

DKD expert reports aim to provide background information and references in connection with other DKD documents as, for example, the DKD guidelines. In some cases, they may even go far beyond these documents. They do not replace the original DKD documents but do provide a lot of supplementary information worth knowing. The expert reports do not necessarily reflect the views of the DKD's Management Board or Technical Committees in all details.

DKD expert reports are intended to present significant aspects from the field of calibration. Through publication by the DKD they are made available to the large community of calibration laboratories, both nationally and internationally.

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1 Background

Advancing digitalisation does also affect the field of calibration. In view of this development and responding to the needs of industry, the digital calibration certificate (DCC) has been developed [1, 2]. The DCC is an XSD schema file that serves as a kind of template for digital calibration certificates for all measurands in XML format. Its implementation therefore requires further, subject-related specifications. To examine potential applications for the mass calibration of weights and weight sets and to determine the related specifications, the DKD Technical Committee *Mass and Weighing Instruments* has set up a group of experts who have created the present document.
This document describes the contents of the digital calibration certificate for mass calibrations of weights and weight sets. The present document refers to version 3.0.0 of the DCC scheme. For implementation, it is recommended to refer to the latest version of the scheme, currently version 3.1.2. This version is completely downward compatible and allows, among other things, improved indication of references.
Given the continuous changes in the field of digital certificates, this report can only reflect the current state of discussions - something to be taken into account in any kind of evaluation or referencing. These changes may refer to changes in the schema file or to higher-level specifications such as coordinated *refType* attributes. The validity of the remaining regulations remains unaffected.

2 DCC - General remarks

The term DCC is used hereinafter to refer to the XSD schema file and its specifications. Detailed examples of the implementation in an XML file can be found in the tables and in the appendix.

2.1 Structure

Generally, the DCC consists of a main element *digitalCalibrationCertificate* with four child elements: *administrativeData*, *measurementResults*, *comments* and *document*. The first two elements must always be used. They are described in detail in this document. Currently, the element *comments* is not used for mass calibration certificates, and it is possible to store a document (for example the pdf version of the calibration certificate) in the element *document*. Most elements contain sub-elements in which the actual information (calibration certificate number, customer information, calibration results...) is arranged on different levels.

2.2 Attributes

It is also possible to attach so-called attributes to various elements. In the DCC these are *id*, *refType* and *refId*. In the case of id, a value unique to the document (e.g. “x1234”) can be assigned (no double use!), *refId* can be used to refer to the element and *refType* can be used for multiple identifiers in the document. Should it be necessary to use two different *refType* attributes, this is possible by using a separator. For this purpose, the underscore “_” is used in the example. The recommended use of the attributes is explained in the rest of the document.

2.3 Namespaces

The “namespaces” used in XML indicate the affiliation of an element to a schema. Due to the fact that the digital SI has its own schema in the digital calibration certificate, there are the namespaces “dcc” and “si” (example: *dcc:administrativeData* and *si:real*). For better readability, only elements of the D-SI are marked hereafter.

2.4 Notation

In the DCC, lower camel case is used for all contents (elements, attributes and specifications in *refType*). This means that a) words are combined, b) the initial letter is written in lower case and c) new word beginnings within the composition are written in upper case. Examples of this are *coreData*, *respAuthority* and *nominalValue*.

2.5 Multi-language support

Depending on the element type in the DCC, it is possible to specify several languages. Many values are expressed as numbers, dates or the like. In these cases, multi-language support is not possible. For the elements *name*, *description* and *text*, however, more than one language can be used continuously (multi-language support). The language is specified in sub-elements by the corresponding country abbreviation: <dcc:content lang="de">Conventional weight</dcc:content> for a German-language variant. Information on the languages used can be found in the element *coreData* (see chapter 3).

2.6 Basic rules in the DCC

2.6.1 The plural in element descriptions

Within the DCC, we often find a combination of the plural form in the parent element and the singular form in the child element.
Example: *measurementResults* → *measurementResult*
In all cases, it is possible to create a list of child elements here, with the parent element serving as a kind of collective folder. In some cases, it is also possible to globally define a name, a description and other information for a list at parent element level.

2.6.2 Local before global

A lot of information, such as measurement methods or general comments, can be stored at various points in the DCC. Hence, the following statement applies: Local information takes precedence over global information. In the absence of local information, the global information passes on to the next level (below).
Example: If a general reference to accreditation is made in the DCC, then it is to be assumed that the accreditation applies to all the information listed. Individual results outside the scope of accreditation should then be explicitly marked. Alternatively, information on accreditation can also be given exclusively for each individual result.

2.7 Weight sets in the DCC

There may be individual weights as well as set of weights. In principle, calibrations of the individual pieces of a set of weights are regarded as individual calibrations. As a result, several individual DCCs should be issued. A future tool for combining these individual DCCs of a set of weights (“Envelope”) is planned. However, it is also possible to display the calibrations of the individual weights within a single DCC.
A consistent solution would be desirable. This report presents the current options without opting for a variant in order to support further discussion. The proposals that have been developed therefore focus on the compatibility between the different approaches. To ensure compatibility, some general rules have to be followed. These are described in section 3.1 and in the introduction to chapter 4.

3 General contents of the element *administrativeData*

The element *administrativeData* contains 7 sub-elements (*dccSoftware*, *coreData*, *items*, *calibrationLaboratory*, *respPerson*, *customer*, *statements*). Explanations regarding the contents can be found on the PTB websites [1] and [2]; examples regarding the contents will

be provided below. The only elements that are described in more detail are *items* and *statements* (paragraphs 3.1 and 3.2).

Main element	Sub-element	Explanation	Value	Sample value
dccSoftware	*software*	List for sub-elements: software	contains child elements	*name* *release* *description*
dccSoftware	*software/ name*	Name of the software	multilingual text	WebStorm
dccSoftware	*software/ -release*	Software version number	arbitrary text (string)	03.01.2019
coreData	*countryCodeISO3166_1*	Country in which the calibration laboratory is located	A-Z; 2 letters	DE
coreData	*usedLangCodeISO639_1*	Languages used, can be repeated as often as required	a-z; 2 letters	de, en
coreData	*mandatoryLangCodeISO639_1*	Legally binding language, can be repeated as often as required	a-z; 2 letters	de
coreData	*uniqueIdentifier*	Number of calibration certificate	arbitrary text (string)	example calibration
coreData	*beginPerformanceDate*	When did the calibration start?	date	2021-06-01
coreData	*endPerformanceDate*	When was the calibration completed?	date	2021-06-02
coreData	*performanceLocation*	Where did the calibration take place?	contains selection of: Laboratory, customer, laboratoryBranch, costumerBranch, other	laboratory (ID possible; suggestion for possible referencing [2]: id="id_performanceLocation")
coreData	*identifications*	List for sub-elements: identification	contains child elements	1 - ∞ identifcation
coreData	*identifications/ identification*	Transaction number	contains child elements	*issuer: calibrationLaboratory* *value:* 437000111 *name:* SAP number
coreData	identifications/ identification	Transaction number	contains child elements	*issuer: calibrationLaboratory* *value:* 06.02.03#0001 *name:* E-file number
items		Information about the calibration item	contains child elements	see chapter 3.1
calibrationLaboratory		Information about the calibration laboratory	contains child elements	*calibrationLaboratoryCode*

Main element	Sub-element	Explanation	Value	Sample value
				contact (child elements: *name, eMail, phone, fax, location, descriptionData*)
respPersons		Persons responsible/in charge	contains child elements	1 - ∞ *respPerson* (child elements: *person, description, role, mainSigner, cryptElectronicSeal, cryptElectronicSignature, cryptElectronicTimeStamp*)
customer		Information about the customer	contains child elements	*name, eMail, phone, fax, location, descriptionData*
statements		Global statements concerning the calibration certificate	contains child elements	see chapter 3.2

Table 1: Examples of content elements in the element *administrativeData*

3.1 Contents of the element *items* for the description of the calibration object(s)

The calibration item is described in the sub-element *items*. Therefore, the content here depends on the type of object to be calibrated. Generally, the sub-element contains further sub-elements: *name*, *equipmentClass*, *description*, *owner*, *identifications* and *item*. All elements – except *item* – are used in the mass calibration certificate to describe a set of weights as a whole. In the element *identifications*, a list of properties or descriptions can be created, each consisting of a name/designation, a value and the issuing authority. Thus, identifications or identification numbers can be stored here. In the case of an individual calibration certificate for a weight that actually belongs to a set, information regarding the set of weights must also be entered here to ensure compatibility and to identify the piece of weight.

The sub-element *item* can be used several times and the descriptions of individual weights can be stored here. In case of calibrating individual weights, the information should also be stored here. In both cases, the assignment of an *id* to this element is important in order to be able to assign the measurement results to the respective object. Again, the elements *name*, *description*, *manufacturer* and *identifications* are available for describing the objects. The nominal value of the weight should be used to name the object (in textual form). This name is used as the main identifier. A machine-readable representation of the nominal value can be found in the results section of the DCC (see section 4.4). It is recommended to include individual information necessary for the recognition and description of the objects in a list of *identifications* with name, description and issuing body. These can be serial numbers, position in the weight set box, shape, material and others. For frequently used identifiers, the use of consistent *refType* attributes is recommended.

Main element	Sub-element	Explanation	Sample value	refType
items	*name*	Name of the calibration item (optional)	Set of weights up to 2 kg	-
items	*equipmentClass*	Product standard & accuracy class according to standard (optional)	*reference:* OIML R111-1:2004 *classID:* E2	-

Main element	Sub-element	Explanation	Sample value	refType
items	*description*	Housing/box (optional)	Storage: The weights are stored in a box of varnished wood.	-
items	*owner*	Owner of the calibration item(s) (optional)		-
identifications	*identification*	Serial number (of the weight set)	*issuer: manufacturer* *value:* xyz1234567 *name:* serial number	*serialNoWeightSet*
identifications	*identification*	Manufacturing date	*issuer: manufacturer* *value:* UTC 2020-01-01 19:35:50 *name:* manufacturing date	*manufacturingDate*
identifications	*identification*	Identification number (by the owner)	*issuer: owner* *value:* 123-123 *name:* Identification number	*weightSetID*
items	1 - ∞ *item*	Several calibration items or parts of an object	see rest of Table: 2 weights (ABC1234, ABC5678), one of them in detail	-
item (id: weightABC1234)	*name*	Name of the element (of the set of weights) (nominal value)	“2 kg”	-
	equipmentClass	Product standard & accuracy class according to standard (optional)	*reference:* OIML R111-1:2004 *classID:* E2	-
	description	Human readable description (optional)	description of packaging	-
	manufacturer:name	Name of manufacturer	Weights & Co Ltd.	-
	identifications	Manufacturing date	*issuer: manufacturer* *value:* UTC 2020-01-01 19:35:50 *name:* manufacturing date	*manufacturingDate*
	identifications	Internal identification number of the element‘s position in the weight set	*issuer: manufacturer* *value:* ABC1234 *name:* idendification number	*setPosition*
	identifications	Internal identification number of the physical element in the set element	*issuer: owner* *value:* XYZ4567 *name:* database number of the weight	*objectId*
	identifications	Shape	*issuer: manufacturer* *value:* knob weight *name:* shape	*shape*
	identifications	Material	*issuer: manufacturer* *value:* stainless steel *name:* material	*material*
	identifications	Distinguishing feature (differentiator)	*issuer: manufacturer* *value:* * *name:* additional identification	*differentiator*

Main element	Sub-element	Explanation	Sample value	refType
	identifications	User marking 1	*issuer: owner* *value:* 213 *name:* user marking 1	*userMarking 1*
	identifications	User marking 2	*issuer: owner* *value:* ABC *name:* user marking 2	*userMarking 2*
items	*id: weightABC5678* (The sub-elements are indicated in the same way as in the example for *id*: weightABC1234, see also Appendix C)			

Table 2: Examples of contents in the element *items*

3.2 Contents of the element *statements*

The element *statements* offers the possibility to add all kind of additional information to the calibration certificate. It is possible to create any number of individual *statement* elements; these, in turn, can be a combination of the following elements:

Main element	Sub-element(s) or value	Explanation	Sample value
countryCode ISO3166_1	A-Z; 2 letters	Indication of a country code	DE
convention	Arbitrary text (string)	Indicating a convention, e.g. as a reference	standard A, section 2
traceable	boolean	Indication as to whether the result/measurement is traceable	yes
norm	Arbitrary text (string)	Indication of a standard	ISO/IEC 17025
reference	Arbitrary text (string)	Indication of a reference	Number of a referenced calibration certificate
declaration	Multilingual text	Explanation (also multilingual)	Is traceable to SI.
valid	boolean	Indication of validity	true
date	Date	Indication of a date in xs:date	2000-01-01
period	Duration	Indication of duration in xs:duration	P10Y
respAuthority	*name, eMail, phone, fax, location, descriptionData*	Indication of a contact, incl. address	DAkkS …
conformity	Contains selection of: *pass, fail, conditionalPass, conditionalFail, noPass, noFail*	Conformity statement	pass
data	Different sub-elements	Indication of formulas and numerical values possible (also with measurement uncertainty)	*text, formula, byteData, xml, quantity, list*

Table 3: Examples of contents in the element *statements*

The possibilities for using the *statement* element are manifold. In most cases, purely human-readable information is stored. However, machine-readable information can also be stored using formats such as time, duration and general data. Using *id*, *refId* and *refType* (see paragraph 2.2), both variants can also be linked to other elements.
Examples of combinations that can be used:

- "true" (*traceable*), "Is traceable to SI." (*declaration*),
- "OIML R111 x.y" (*norm*)
- "D-K-xxxxx-yy-zz" (*reference*), "This value lies within the calibration and measurement capabilities."
- "DIN EN ISO/IEC 17025:2018-03" (*norm*), "7.8.2.1 1)" (*reference*), "The results only refer to the object described in this DCC." (*declaration*)
- "With the introduction of a consensus value for the dissemination of the unit of mass by the 'Comité consultatif pour la masse et les grandeurs apparentées' (CCM) on 1 February 2021, the standard uncertainty of the mass of the International Prototype Kilogram traceable to this consensus value is 0.020 mg (relative standard uncertainty $2 \cdot 10^{-8}$). This uncertainty contribution is to be taken into account in the dissemination of the unit after 1 February 2021 and is already included in the stated uncertainty." (*declaration*)
- "Calibration certificate PTB-1.8-1274", "PTB AG x, Bundesallee 100, Braunschweig" (*respAuthority*)

So far, the following *refType* descriptions have been identified for use: "*isInCMC*", "*source*" and "*conformity*". In addition, the use of a *statement* element with the *id="id_performanceLocation"* offers the possibility of specifying the location of the calibration in the *respAuthority* element (see also Table 1).

4 Contents in the result area *measurementResults*

As with the subdivision of the *items* element into an unlimited number of item elements, several *measurementResult* results can be stored in the *measurementResults* part of the DCC. With regard to mass, we suggest using one *measurementResult* for each weight. In this case, it is generally assumed that there is one *measurementResult* for each "separable" measurement. This means that the information must be separated, even though – in case of doubt – several calibration certificates can be issued. In this way, compatibility is ensured even if data from several documents are to be used. Specifically for mass calibration, this means that there should be no difference as to whether a single calibration certificate is issued for a set of weights or whether the corresponding number of individual calibration certificates is issued.
Note: Since the same measurements are used to determine mass and conventional weight value, these results are listed here in just one *measurementResult* (see also examples in Appendices B and C). Therefore, they are indicated as two results of the same measurement, each of them having the same ambient conditions (see section 4.4).
In addition to a name and a human-readable description, each *measurementResult* element also has the attribute *refId* which is used to set the reference to objects listed in the *items* area.

Main element	Sub-element	Explanation	Sample value
measurementResult (refId: weightABC1234)	*name*	Name of the result (multilingual text)	Mass calibration Weight ABC1234
	description	Description of the result (multilingual text, optional)	Mass calibration after revision of the piece of weight
	usedMethods	Description of the methods (optional)	see chapter 4.1
	usedSoftware	Description of the evaluation software used (optional)	1 - ∞ *software* (child elements: *name*, *release*, *description*)
	measuringEquipment	Description of the measuring equipment (optional)	see chapter 4.3
	influenceConditions	Description of measurement results (optional)	see chapter 4.2
	results	Results	see chapter 4.4
	measurementMetaData	Additional information (optional)	see chapter 4.5

Table 4: Example of contents in the element *measurementResult*

List of identified possible *refTypes* especially in the results part (usable in the elements *influenceCondition* – chapter 4.2, results – chapter 4.4 und *measurementMetaData* – chapter 4.5):

- *humidity*
- *temperature*
- *airpressure*
- *volume*
- *density*
- *mass*
- *conventionalWeighingValue*
- *min*
- *max*
- *nominalValue* (only to be used in the *result* element)
- *measurementValue* (only to be used in the *result* element)
- *referencedValue*
- *measurementDeviation* (only to be used in the *result* element)
- *meanValue*

4.1 Sub-element *usedMethods*

The element *measurementResult* contains the sub-element *usedMethods* to describe the calibration methods used. This sub-element consists of any number of child elements *usedMethod*; each of these child elements contains a name and a description.

Main element	Sub-element	Explanation	Sample value
usedMethod (id: method1)	*name*	Name of a (partial) method	Determination of the conventional weighing value
	description	Description of a (partial) method (optional)	In-house procedure according to instructions xy
	norm	Indication of a standard	OIML R111-1:2004
usedMethod (id: method2)	*name*	Name of a (partial) method	Determination of the mass
	description	Description of a (partial) method (optional)	In-house procedure according to instructions xy
	norm	Indication of a standard	OIML R111-1:2004

Table 5: Example of contents in the element *usedMethods*

4.2 Sub-element *influenceConditions*

The element *measurementResult* contains the sub-element *influenceConditions* to describe the influences or boundary conditions acting on the calibration. The element consists of any number of child elements *influenceCondition*, which, in addition to name and description, can also have an optional status specification and a *data* element for specifying numerical values with or without measurement uncertainty or formulas. When using numerical values, the D-SI schema is used here; it will be described in more detail in chapter 5.
Ambient conditions can also be specified with upper and lower limits instead of a single value. For this purpose, two *quantity* elements with maximum and minimum values are created in the same *data* element. For differentiation, the *quantity* elements each receive a *refType*: *max* and *min*.

Main element	Sub-element	Sample value	refType
influenceCondition	*name*	Temperature	*temperature (influenceCondition)*
	data	21.5°C U = 0.5°C (k = 2)	-
influenceCondition	*name*	Density of the weight	*density (influenceCondition)*
	data	8010 kg/m³ U = 30 kg/m³ (k = 2)	-
influenceCondition	*name*	Air density	*airDensity (influenceCondition)*
	data	1.1635 kg/m³ U = 0.0035 kg/m³ (k = 2)	-
influenceCondition	*name*	Relative humidity	*humidity (influenceCondition)*
	data	0.417 U = 0.020 (k = 2)	-
influenceCondition	*name*	Air pressure	*airPressure (influenceCondition)*
	data (with 2 *quantity* elements)	1008.04 hPa U = 0.06 hPa (k = 2)	*min*
		1008.18 hPa U = 0.06 hPa (k = 2)	*max*

Table 6: Example of contents in the element *influenceCondition*

4.3 Sub-element *measuringEquipments*

In the element *measuringEquipments*, it is possible to insert several *measuringEquipment* elements documenting the measuring equipment used. These elements in turn have eight sub-elements which are described in the following table.

Element	Explanation	Sample value
name	Name of the measuring equipment	Weighing instrument A
equipmentClass	Device class (optional)	*reference:* OIML R111 *classID:* E2
description	Description of the measuring equipment	comparator balance
desriptionData	Additional, attached documents	pdf of the calibration certificate of the measuring equipment
certificate	currently not used indication of a checksum for comparison with a document is intended here	-
manufacturer	Manufacturer of the measuring equipment, including contact data	manufacturer a street b city xy
model	type of measuring equipment (model)	Type A8j
identifications	further information about the measuring equipment in the form of the *identifications* as in paragraph 3.1	*issuer: manufacturer* *value:* 492755j38d *name:* identification number

Table 7: Examples of contents in the element *measuringEquipment*

4.4 Sub-element *results*

The element *results* offers the possibility to insert several result elements. These again have three sub-elements: *name* (mandatory), *description* (optional) and *data* (mandatory). Hence, each result has a name. For mass, these would be “Conventional weighing value” and “Mass” (see introduction chapter 4). In both cases, two or, if applicable, three sub-elements *data* are used to represent the measurement result. This element in turn provides the possibility to enter texts, lists, formulas and individual measurement values. In the case of the mass calibration certificate, the sub-element *quantity* and, within it, the *si:real* are used, as is the case with the sub-element *influenceConditions* (see paragraph 4.2).
The nominal value of the weight is specified in machine-readable form in the *results* element. This is done in addition to its specification in the *item* element (identification for the human user) since the nominal value also corresponds to the uncorrected indication value of a indicating measuring device (see 3.6 and 4.1 in [3]).
As for the result “conventional weighing value”, the nominal value as well as the determined value and/or also the deviation of the nominal value can be indicated here. For the result of mass, the nominal value and the determined value are indicated. For each of the two results (“conventional weighing value” and “mass”), a *data* element is used containing a simple string of *quantity* elements (see Table 8 and examples given in the appendix). In this case, the D-SI scheme is used. It will be described in more detail chapter 5.

Main element	Sub-element	Explanation	Sample value	*refType (refId)*
results	*result*	Parent element for a single result	Child elements	*conventionalMass*
result	*name*	Name of the result	Conventional weighing value	-
result	*data* (with 3 *quantity* elements)	Result	1.0000009 kg *U* = 0.0000032 kg (*k* = 2)	*measurementValue*
		Nominal value (*si:real* or *si:constant* possible)	1 kg	*nominalValue*
		Deviation	0.0000009 kg *U* = 0.0000032 kg (*k* = 2)	*measurementDeviation*
results	*result*	Parent element for a single result	Child elements	*mass*
result	*name*	Name of the result	Mass	-
result	*data*	Result	1.0000003 kg *U* = 0.0000032 kg (*k* = 2)	*measurementValue*

Table 8: Examples of contents in the element *results*

4.5 Special case *measurementMetaData*

The element *measurementMetaData* can be found in several places in the area *measurementResults*. Specifically, this is the case for the following elements:

- *measurementResult*
- *quantity* (sub-element of *data*, present in the elements *influenceCondition*, *result* and *statement*)
- *list* (sub-element of *data*, present in the elements *influenceCondition*, *result* and *statement*)

Its structure is identical to that of the *statements* element (paragraph 3.2). It is used for statements relating not only to the entire calibration certificate, but also to individual measurement results (*measurementResult*) and individual measurement values (*quantity* and *list*). As described in paragraph 3.2, this allows to further specify conformity statements or the scope of accreditation. Specific examples for use in the *measurementMetaData* element are given in the following table.

Main element	Sub-element	Explanation	Sample value
measurement-MetaData	*refType*		conformity
	convention		section 5.3.2
	norm	Reference to a standard /normative document	OIML R111
	declaration	Indication of a text (also multilingual!)	“Binary, Guard banded acceptance *w=U* and TUR >=3”
	conformity	Indication of conformity decision	pass
	data	Use of a D-SI element for indication of data	maximumPermissibleError 1E-6 kg
measurement-MetaData	*traceable*	Boolean value	false
	declaration	Indication of a text (also multilingual!)	“Value not traceable”
measurement-MetaData	*refType*		isInCMC
	reference	string	D-K-xxxxx-yy-zz (DAkkS registration number)
	valid	boolean	true
	declaration	Indication of a text (also multilingual!) Not mandatory since it is only relevant for human readers	“This value lies within the calibration and measurement capabilities.”
	respAuthority	Contact information of the responsible authority	German Accreditation Body…
measurement-MetaData	*refType*		source
	reference	Referenced calibration certificate	Certificate XXXXX
	date	Date of the certificate	2021-04-01
	respAuthority	Issuing authority	PTB…

Table 9: Examples of contents in the element *measurementMetaData*

Agreement regarding the use of information:

- Each result should carry the *refType* “*isInCMC*”, results without this entry are automatically assumed outside the calibration and measurement capabilities for which the laboratory has been accredited. Alternatively, a global entry for the entire DCC is possible in the *statements* area; local exceptions can be marked via the rule “local before global” (see section 2.6.2).

5 D-SI indications in the DCC

The digital SI (D-SI) is described in a separate XML schema; elements are therefore marked with the prefix “si”. It concentrates on the indication of numerical values including their uncertainty. This has already been illustrated at several points in this document (paragraphs 4.2 and 4.4). However, indication of the measurement uncertainty can also be omitted (see indication of the nominal value in paragraph 4.4). It should be noted that measurement uncertainties in the D-SI must always be indicated using the same unit as the measurement result. For more information on this schema, see [4] and [5].

The D-SI does also contain various sub-elements. For the mass calibration certificate, however, only the *si:real* element is used. The sub-elements of the *si:real* element are listed in the following table.

Element	Explanation	Sample value
label	Designation (optional)	nominal value
value	Numerical value (double)	1.00000009
unit	Unit to numerical value	\kilogram
dateTime	Time stamp (optional)	
selection (both optional):	Selection for specifying the measurement uncertainty (optional)	-
expandedUnc	Expanded measurement uncertainty Coverage factor Coverage probability Distribution function (optional)	0.00000032 2 0.95
coverageInterval	not used here	-

Table 10: Examples of contents in the element D-SI

6 Bibliography

[1] Dokumentation zum DCC-Schema, https://www.ptb.de/dcc/
[2] Dokumentation zum DCC-Schema Version 3.0.0, https://www.ptb.de/dcc/v3.0.0/
[3] International vocabulary of metrology – Basic and general concepts and associated terms (VIM)- 3rd edition. https://jcgm.bipm.org/vim/en/index.html; Internationales Wörterbuch der Metrologie – Grundlegende und allgemeine Begriffe und zugeordnete Benennungen (VIM), German-English version ISO/IEC Guideline 99:2007, corrected version 2012, 4th edition, DIN Deutsches Institut für Normung e. V.
[4] Hutzschenreuter, Daniel, et al. (2020). SmartCom Digital System of Units (D-SI) Guide for the use of the metadata-format used in metrology for the easy-to-use, safe, harmonised and unambiguous digital transfer of metrological data - Second Edition (D-SI 1.3.0-2). Zenodo. https://doi.org/10.5281/zenodo.3816686
[5] Hutzschenreuter, Daniel, et al. (2019). SmartCom Digital-SI (D-SI) XML exchange format for metrological data version 1.3.0 (1.3.0). Zenodo. https://doi.org/10.5281/zenodo.3366902

Appendix A List of possible elements of a calibration certificate for weights

Element (English)	Element (German)	Remarks, explanation	necessary, optional	DCC Element	Explanation
Serial Number of Weight set	Seriennummer	Identifier of “the box”	necessary	dcc:administrativeData: items: identifications: identification	issuer: manufacturer value: XYZ1234567 description: “serial number”
Manufacturer name	Name des Herstellers	Identification of the manufacturer	necessary	dcc:adminstrativeData: items: item: manufacturer	Manufacturer only possible per item (but can of course be repeated everywhere)
Standard	Produktnorm	Reference to a standard	optional		
Accuracy Class of Standard	Genauigkeitsklasse nach Norm	The class refers to the standard given above	optional	dcc:administrativeData: items:(item:) equipmentClass	reference: OIML R111-1:2004 classID: E2
Manufacuring Date	Herstellungsdatum	Manufacturing Date	optional	dcc:administrativeData: items:(item:) identifications: identification	issuer: manufacturer value: UTC 2020-01-01 19:35:50 description: “manufacturing date”
User generated identification number for set	Identifikationsnummer	Some users have their own equipment-ID on the box	optional	dcc:administrativeData: items:identifications: identification	issuer: owner value: 123-123 description: “identification number”
Housing/Box	Behältnis/ Kasten	Description of the box	optional	dcc:administrativeData: items:(item:) description	
Name of calibration object	Bezeichnung des Kalibrierobjektes		optional	dcc: administrativeData: items: name	
Name of element in set	Name des Satzelements			dcc:administrativeData: items:item:name	
Internal number of element position in weight set	Interne Identifikations-nummer der Element-position im Satz	Database identifier for the element position in the weight set		dcc:administrativeData: items:item: identifications: identification	issuer: owner value: ABC1234 description: “internal number of the weight”
Nominal value	Nominalwert	Nominal value	necessary	dcc: measurementResults: measurementResult: resultsresult: data:quantity	
Nominal value unit	Einheit des Nominalwerts	SI unit for nominal value	necessary	im passenden quantity:si:real:unit	
Internal identifier of physical element (weight)	Interne Identifikations-nummer des physischen Elements im Satz-Element	Database identifier for individual weight piece	necessary	dcc:administrativeData: items:item: identifications: identification	issuer: owner value: XYZ4567 description: “data base number of the weight”
Specification	Spezifikation	Reference to pass/fail specification, in accordance with ISO/IEC 17025	optional	dcc:measurementResults: measurementResult: measurementMetaData: metaData:convention	
Accuracy class	Genauigkeitsklasse	Accuracy class of pass/fail specification	optional	dcc:measurementResults: measurementResult: measurementMetaData: metaData: refID auf equipmentClass	

Shape	Form	Physical shape of the weight.	necessary	dcc:administrativeData: items:item: identifications: identification	issuer: manufacturer value: knob weight description: shape
Material	Material	Text, for verification of correctness by human only	optional	dcc:administrativeData: items:item: identifications: identification	issuer: manufacturer value: stainless steel description: “material”
Differentiator	Unterscheidungs-merkmal	Differentiator marking if two items with the same nominal value in the set	necessary if two items with same nominal	dcc:administrativeData: items:item: identifications: identification	issuer: manufacturer value: * description: “Additional information”
UserMarking1	Benutzermarkierung 1	User marking on weight	optional	dcc:administrativeData: items:item: identifications: identification	issuer: owner value: 213 description: “User marking 1”
UserMarking2	Benutzermarkierung 2	User marking on weight	optional	dcc:administrativeData: items:item: identifications: identification	issuer: owner value: ABC description: “User marking 2”
Method of density determination	Methode der Dichte-bestimmung	For OIML can be *structured* reference to OIML R111	necessary	dcc:measurementResults: measurementResult: influenceConditions: influenceCondition: data:quantity: usedMethods: usedMethod	
Density value	Wert der Dichte	weight material density	necessary	dcc:measurementResults: measurementResult: influenceConditions: influenceCondition: data:quantity:si:real:value)	
Density value uncertainty	Unsicherheit der Dichte	weight material density	necessary	together with value of density (quantity quantity:si:real: expandedUnc:uncertainty	
Density SI unit	SI-Einheit der Dichte	weight material density	necessary	together with value of density (quantity:si:real:unit)	
Density uncertainty coverage factor	Erweiterungsfaktor der Dichteunsicherheit	weight material density	necessary	together with value of density (quantity:si:real: expandedUnc: coverageFactor)	
Density uncertainty coverage probability	Überdeckungs-wahrscheinlichkeit der Dichteunsicherheit	weight material density	necessary	together with value of density (quantity:si:real: expandedUnc: coverageProbability)	
Source of density value	Quelle für den Dichtewert	Can refer to a previous certificate number from a different organization	optional	dcc:measurementResults: measurementResult: influenceConditions: influenceCondition: data:quantity: measurementMetaData: metaData: reference&date	
Minimal value for density	Minimalwert für die Dichte	Tolerance limit value taken from the specification	optional	dcc:measurementResults: measurementResult: influenceConditions: influenceCondition: data:quantity: measurementMetaData: metaData:data:quantity	
Maximum value for density	Maximalwert für die Dichte	Tolerance limit value taken from the specification	optional	dcc:measurementResults: measurementResult: influenceConditions: influenceCondition: data:quantity:	

				measurementMetaData: metaData:data:quantity	
Tolerance limit value (density) SI unit	SI-Einheit für den Grenzwert der Dichte	Tolerance limit value unit taken from the specification	optional	together with minimum and maximum value of density (quantity:si:real:unit)	
Decision rule selection reason (density)	Grund für die Wahl der Entscheidungsregel (Dichte)	reason for selecting the rule, structured	optional	dcc:measurementResults: measurementResult: influenceConditions: influenceCondition: data:quantity: measurementMetaData: metaData:convention	
Decision rule (density)	Benennung der Entscheidungsregel (Dichte)	Decision Rule from list, structured	optional		
Decision (density)	Entscheidung (Dichte)	Decision result, structured	optional	dcc:measurementResults: measurementResult: influenceConditions: influenceCondition: data:quantity: measurementMetaData: metaData:conformity	
Used method of Conventional Weighing Value calibration	Angewendete Methode für die Kalibrierung des konventionellen. Wägewertes	Reference to standardized method or to own method	necessary	dcc:measurementResults: measurementResult: usedMethods: usedMethod	name: determination of the conventional weighing value description: OIML R111-1:2004
Conventional Weighing Value under CMC	Kalibrierung des konventionellen. Wägewerts unter CMC?	Is result beneath CMC/ accreditation?	necessary if “conv. weighing value” is reported	dcc:measurementResults: measurementResult: results:results: data:quantity: measurementMetaData: metaData:tracebility	am quantity conventional-WeighingValue
Conventional Weighing Value	konventioneller Wägewert			dcc:measurementResults: measurementResult: results:result: data:quantity	as single result in measurement-Result “mass”
DELTA-Conventional Weighing Value value	Abweichung des konventionellen Wägewerts vom Nominalwert	DELTA-Calibration result of conventional mass ref. Nominal value	necessary	dcc:measurementResults: measurementResult: results:result: data:quantity	
DELTA Conventional Weighing Value value uncertainty	Unsicherheit des konventionellen Wägewertes	Calibration result of conventional mass	necessary	together with value of deviation (quantity:si:real: expandedUnc:uncertainty)	
DELTA Conventional Weighing Value SI unit	SI-Einheit für den konvent. Wägewert	Calibration result of conventional mass	necessary	together with value of deviation (quantity:si:real:unit)	
Conventional Weighing Value uncertainty coverage factor	Erweiterungsfaktor der Unsicherheit des konventionellen. Wägewerts	Calibration result of conventional mass	necessary	together with value of deviation (quantity:si:real: expandedUnc: coverageFactor)	
Conventional Weighing Value uncertainty coverage probability	Überdeckungs-wahrscheinlichkeit der Unsicherheit des konventionellen Wägewerts	Calibration result of conventional mass	necessary	together with value of deviation (quantity:si:real: expandedUnc: coverageProbability)	
Used method of Mass calibration	Angewendete Methode für die Kalibrierung der Masse	Reference to standardized method or to own method (TRUE mass)	necessary	dcc: measurementResults: measurementResult: usedMethods: usedMethod	

Mass under CMC	Massekalibrierung unter CMC?	Is result under CMC/ accreditation? TRUE/FALSE, is binary	necessary if “true mass” is reported	dcc:measurementResults: measurementResult: results:results: data:quantity: measurementMetaData: metaData:tracebility	quantity measurement-Value
DELTA True mass value	Abweichung der Masse vom Nominalwert	DELTA Calibration result mass ref. Nominal value	optional if requested by customer	dcc: measurementResults: measurementResult: results:results: data:quantity	as single result in m measurement-Result “mass”
mass value uncertainty	Unsicherheit der Masse	Calibration result	optional if requested by customer	together with value of mass (quantity:si:real: expandedUnc:uncertainty)	
mass SI unit	SI-Einheit für die Masse	Calibration result	optional if requested by customer	together with value of mass (quantity:si:real:unit)	
mass uncertainty coverage factor	Erweiterungsfaktor der Unsicherheit der Masse	Calibration result	optional if requested by customer	together with value of mass (quantity:si:real: expandedUnc: coverageFactor)	
mass uncertainty coverage probability	Überdeckungs-wahrscheinlichkeit der Unsicherheit der Masse	Calibration result	optional if requested by customer	together with value of mass (quantity:si:real: expandedUnc: coverageProbability)	
Date/Time of calibration	Datum und Zeit der Kalibrierung	Date/Time Stamp of this calibration value	necessary	dcc:measurementResults: measurementResult: measurementMetaData: metaData:date	
Temperature during calibration value	Temperatur-wert während der Kalibrierung	Ambient conditions	necessary	dcc:measurementResults: measurementResult: influenceConditions: influenceCondition: data:quantity	
Temperature during calibration uncertainty	Unsicherheit der Temperatur während der Kalibrierung	Ambient conditions	necessary	together with value of temperature (quantity:si:real: expandedUnc:uncertainty)	
Temperature during calibration SI unit	SI-Einheit der Temperatur während der Kalibrierung	Ambient conditions	necessary	together with value of temperature (quantity:si:real:unit)	
Temperature during calibration coverage factor	Erweiterungsfaktor der Unsicherheit der Temperatur während der Kalibrierung	Ambient conditions	necessary	together with value of temperature (quantity:si:real: expandedUnc: coverageFactor)	
Temperature during calibration coverage probability	Überdeckungs-wahrscheinlichkeit der Unsicherheit der Temperatur während der Kalibrierung	Ambient conditions	necessary	together with value of temperature (quantity:si:real: expandedUnc: coverageProbability)	
Air density during calibration value	Luftdichte während der Kalibrierung	Ambient conditions	necessary	dcc:measurementResults: measurementResult: influenceConditions: influenceCondition: data:quantity	
Air density during calibration uncertainty	Unsicherheit der Luftdichte während der Kalibrierung	Ambient conditions	necessary	together with value of air density (quantity:si:real: expandedUnc:uncertainty)	
Air density during calibration SI unit	SI-Einheit der Luftdichte während der Kalibrierung	Ambient conditions	necessary	together with value of air density (quantity:si:real:unit)	
Air density during calibration coverage factor	Erweiterungsfaktor der Unsicherheit der Luftdichte während der Kalibrierung	Ambient conditions	necessary	together with value of air density (quantity:si:real: expandedUnc: coverageFactor)	

Air density during calibration coverage probability	Überdeckungs-wahrscheinlichkeit der Unsicherheit der Luftdichte während der Kalibrierung	Ambient conditions	necessary	together with value of air density (quantity:si:real: expandedUnc: coverageProbability)	
Maximum permissible deviation (conventional mass)	Maximal zulässige Abweichung (konvent. Wägewert)	Tolerance limit value taken from the specification	necessary if “Specifi-cation” is not empty, else optional	dcc:measurementResults: measurementResult: results:result: data:quantity: measurementMetaData: metaData: data:quantity	result conventional-WeigingValue
Maximum permissible deviation (conventional mass) SI unit	SI-Einheit der maximal zulässigen Abweichung (konvent. Wägewert)	Tolerance limit value unit taken from the specification	necessary if “Tolerance Limit value” is not empty	together with value of conventional mass (quantity:si:real:unit)	
Decision rule selection reason (conventional mass)	Grund für die Wahl der Entscheidungsregel (konventioneller. Wägewert)	reason for selecting the rule, structured	necessary if “Tolerance Limit value” is not empty	dcc:easurementResults: measurementResult: results:result: data:quantity: measurementMetaData: metaData:convention	
Decision rule (conventional mass)	Benennung der Entscheidungsregel (konv. Wägewert)	Decision Rule from list, structured	necessary if “Tolerance Limit value” is not empty		
Decision (conventional mass)	Entscheidung (konv. Wägewert)	Decision result, structured	necessary if “Specifi-cation” is not empty.	dcc: measurementResults: measurementResult: results:result: data:quantity: measurementMetaData: metaData:conformity	

Appendix B Example of a digital calibration certificate for a single weight

```
<?xml version="1.0" encoding="UTF-8"?>

<dcc:digitalCalibrationCertificate
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:schemaLocation="https://ptb.de/dcc https://ptb.de/dcc/v3.0.0/dcc.xsd"
xmlns:dcc="https://ptb.de/dcc"
xmlns:si="https://ptb.de/si" schemaVersion="3.0.0">

<!--This is an example for a single weight. The example has been created by DKD’s
Technical Committee Mass and Weighing Instruments.
    Version of the example: V1.3 , Date: 19.04.2022   -->

<dcc:administrativeData>
<dcc:dccSoftware>
<dcc:software>
<dcc:name>
<dcc:content>WebStorm</dcc:content>
</dcc:name>
<dcc:release>2019.1.3</dcc:release>
</dcc:software>
</dcc:dccSoftware>

<dcc:coreData>
<dcc:countryCodeISO3166_1>DE</dcc:countryCodeISO3166_1>
<dcc:usedLangCodeISO639_1>de</dcc:usedLangCodeISO639_1>
<dcc:usedLangCodeISO639_1>en</dcc:usedLangCodeISO639_1>
<dcc:mandatoryLangCodeISO639_1>de</dcc:mandatoryLangCodeISO639_1>
<dcc:uniqueIdentifier>Example calibration</dcc:uniqueIdentifier>
<dcc:identifications>
<dcc:identification>
<dcc:issuer>calibrationLaboratory</dcc:issuer>
<dcc:value>437000111</dcc:value>
<dcc:name>
<dcc:content lang="de">SAP-Nummer</dcc:content>
<dcc:content long="en">SAP number</dcc:content>
</dcc:name>
</dcc:identification>
<dcc:identification>
<dcc:issuer>calibrationLaboratory</dcc:issuer>
<dcc:value>06.02.03#0001</dcc:value>
<dcc:name>
<dcc:content lang="de">Aktennummer</dcc:content>
<dcc:content long="en">File number</dcc:content>
</dcc:name>
</dcc:identification>
</dcc:identifications>
<dcc:beginPerformanceDate>2021-06-01</dcc:beginPerformanceDate>
<dcc:endPerformanceDate>2021-06-02</dcc:endPerformanceDate>
<dcc:performanceLocation>laboratory</dcc:performanceLocation>
</dcc:coreData>

<dcc:items>
<dcc:item id="weightABC1234">
<dcc:name>
<dcc:content lang="de">2 kg</dcc:content>
<dcc:content long="en">2 kg</dcc:content>
</dcc:name>
<dcc:equipmentClass>
<dcc:reference>OIML R111-1:2004</dcc:reference>
<dcc:classID>E2</dcc:classID>
</dcc:equipmentClass>
<dcc:description>
<dcc:content lang="de">Beschreibung der Verpackung (optional)</dcc:content>
```

```
<dcc:content lang="en">Description of box/case (optional)</dcc:content>
</dcc:description>
<dcc:manufacturer>
<dcc:name>
<dcc:content>Weights Co Ltd.</dcc:content>
</dcc:name>
</dcc:manufacturer>
<dcc:identifications>
<dcc:identification refType="manufactoringDate">
<dcc:issuer>manufacturer</dcc:issuer>
<dcc:value>UTC 2020-01-01 19:35:50</dcc:value>
<dcc:name>
<dcc:content lang="de">Herstellungsdatum</dcc:content>
<dcc:content long="en">Manufacturing Date</dcc:content>
</dcc:name>
</dcc:identification>
<dcc:identification refType="setPosition">
<dcc:issuer>owner</dcc:issuer>
<dcc:value>ABC1234</dcc:value>
<dcc:name>
<dcc:content lang="de">Interne Nummer der Elementposition</dcc:content>
<dcc:content long="en">Internal number of the element position</dcc:content>
</dcc:name>
</dcc:identification>
<dcc:identification refType="objectId">
<dcc:issuer>owner</dcc:issuer>
<dcc:value>XYZ4567</dcc:value>
<dcc:name>
<dcc:content lang="de">Datenbanknummer des Gewichts</dcc:content>
<dcc:content long="en">Database number of the weight</dcc:content>
</dcc:name>
</dcc:identification>
<dcc:identification refType="shape">
<dcc:issuer>manufacturer</dcc:issuer>
<dcc:value>Knob weight</dcc:value>
<dcc:name>
<dcc:content lang="de">Form</dcc:content>
<dcc:content long="en">Form</dcc:content>
</dcc:name>
</dcc:identification>
<dcc:identification refType="material">
<dcc:issuer>manufacturer</dcc:issuer>
<dcc:value>Stainless Steel</dcc:value>
<dcc:name>
<dcc:content lang="de">Material</dcc:content>
<dcc:content long="en">Material</dcc:content>
</dcc:name>
</dcc:identification>
<dcc:identification refType="differentiator">
<dcc:issuer>manufacturer</dcc:issuer>
<dcc:value>*</dcc:value>
<dcc:name>
<dcc:content lang="de">Zusatzindentifikation</dcc:content>
<dcc:content long="en">Additional identification</dcc:content>
</dcc:name>
</dcc:identification>
<dcc:identification refType="userMarking1">
<dcc:issuer>owner</dcc:issuer>
<dcc:value>321</dcc:value>
<dcc:name>
<dcc:content lang="de">Nutzermarkierung 1</dcc:content>
<dcc:content long="en">User marking 1</dcc:content>
</dcc:name>
</dcc:identification>
<dcc:identification refType="userMarking2">
```

```
<dcc:issuer>owner</dcc:issuer>
<dcc:value>CBA</dcc:value>
<dcc:name>
<dcc:content lang="de">Nutzermarkierung 2</dcc:content>
<dcc:content long="en">User marking 2</dcc:content>
</dcc:name>
</dcc:identification>
</dcc:identifications>
</dcc:item>
</dcc:items>

<dcc:calibrationLaboratory>
<dcc:contact>
<dcc:name>
<dcc:content>Physikalisch-Technische Bundesanstalt (PTB)</dcc:content>
</dcc:name>
<dcc:eMail>info@ptb.de</dcc:eMail>
<dcc:location>
<dcc:further id="zusatz">
<dcc:content lang="de">Abteilung 1 Mechanik und Akustik</dcc:content>
<dcc:content long="en">Division 1 Mechanics and Acoustics</dcc:content>
</dcc:further>
<dcc:street>Bundesallee</dcc:street>
<dcc:streetNo>100</dcc:streetNo>
<dcc:postCode>38116</dcc:postCode>
<dcc:city>Braunschweig</dcc:city>
<dcc:countryCode>DE</dcc:countryCode>
</dcc:location>
</dcc:contact>
</dcc:calibrationLaboratory>

<dcc:respPersons>
<dcc:respPerson>
<dcc:person>
<dcc:name>
<dcc:content>Michael</dcc:content>
</dcc:name>
<dcc:eMail>info@ptb.de</dcc:eMail>
</dcc:person>
<dcc:role>authorisation of certificate</dcc:role>
</dcc:respPerson>
<dcc:respPerson>
<dcc:person>
<dcc:name>
<dcc:content>Alexander</dcc:content>
</dcc:name>
<dcc:eMail>info@ptb.de</dcc:eMail>
</dcc:person>
</dcc:respPerson>
</dcc:respPersons>

<dcc:customer>
<dcc:name>
<dcc:content>Customer</dcc:content>
</dcc:name>
<dcc:eMail>info@ptb.de</dcc:eMail>
<dcc:location>
<dcc:streetNo>6</dcc:streetNo>
<dcc:street>Hello Street</dcc:street>
<dcc:postCode>10</dcc:postCode>
<dcc:city>Braunschweig</dcc:city>
<dcc:countryCode>DE</dcc:countryCode>
</dcc:location>
</dcc:customer>
```

```
<dcc:statements>

<dcc:statement>
<dcc:norm>DIN EN ISO/IEC 17025:2018-03</dcc:norm>
<dcc:reference>7.8.2.1 l)</dcc:reference>
<dcc:declaration>
<dcc:content lang="de">Die Ergebnisse beziehen sich nur auf den in diesem DCC
beschriebenen Gegenstand.</dcc:content>
<dcc:content long="en">The results refer only to the object calibrated in this
DCC.</dcc:content>
</dcc:declaration>
</dcc:statement>

<dcc:statement refType="isInCMC">
<dcc:reference>D-K-xxxxx-yy-zz</dcc:reference>
<dcc:declaration>
<dcc:content lang="de">Dieser Wert ist innerhalb der Kalibrier- und
Messmöglichkeiten.</dcc:content>
<dcc:content long="en">This result is within the calibration and measurement
capabilities.</dcc:content>
</dcc:declaration>
<dcc:valid>true</dcc:valid>
<dcc:respAuthority>
<dcc:name>
<dcc:content>DAkkS</dcc:content>
</dcc:name>
<dcc:eMail>info@dakks.de</dcc:eMail>
<dcc:location>
<dcc:city>Braunschweig</dcc:city>
</dcc:location>
</dcc:respAuthority>
</dcc:statement>

<dcc:statement>
<dcc:convention>Tracebility</dcc:convention>
<dcc:traceable>true</dcc:traceable>
<dcc:declaration>
<dcc:content lang="de">Die Messung ist auf das SI rückführbar.</dcc:content>
<dcc:content long="en">The measurement is traceable to the SI.</dcc:content>
</dcc:declaration>
</dcc:statement>

<dcc:statement>
<dcc:norm>DIN EN ISO/IEC 17025:2018-03</dcc:norm>
<dcc:reference>7.8.4.3</dcc:reference>
<dcc:declaration>
<dcc:content lang="de">Die Ergebnisse gelten zum Zeitpunkt der Kalibrierung. Es
obliegt dem Verwender, zu gegebener Zeit eine Rekalibrierung zu
veranlassen.</dcc:content>
<dcc:content long="en">The results refer only to the object calibrated in this DCC.
The measurement results are valid at the time of calibration. The user is
responsible for arranging a recalibration in due time.</dcc:content>
</dcc:declaration>
</dcc:statement>

</dcc:statements>

</dcc:administrativeData>

<dcc:measurementResults>
<dcc:measurementResult refId="weightABC1234">

<dcc:name>
<dcc:content>mass calibration</dcc:content>
</dcc:name>
```

```
<dcc:usedMethods>

<dcc:usedMethod refType="conventionalMass">
<dcc:name>
<dcc:content lang="de">Bestimmung des konventionellen Wägewerts</dcc:content>
<dcc:content long="en">Determination of the conventional weighing
value</dcc:content>
</dcc:name>
<dcc:norm>OIML R111-1:2004</dcc:norm>
</dcc:usedMethod>

<dcc:usedMethod refType="mass">
<dcc:name>
<dcc:content lang="de">Verwendete Methode der Massekalibrierung</dcc:content>
<dcc:content long="en">Used method of True Mass calibration</dcc:content>
</dcc:name>
<dcc:norm>OIML R111-1:2004</dcc:norm>
</dcc:usedMethod>

</dcc:usedMethods>

<dcc:influenceConditions>

<dcc:influenceCondition refType="density">
<dcc:name>
<dcc:content lang="de">Dichte</dcc:content>
<dcc:content long="en">Density</dcc:content>
</dcc:name>
<dcc:data>
<dcc:quantity refType="referencedValue">
<si:real>
<si:value>8010</si:value>
<si:unit>\kilogram\metre\tothe(-3)</si:unit>
<si:expandedUnc>
<si:uncertainty>30</si:uncertainty>
<si:coverageFactor>2</si:coverageFactor>
<si:coverageProbability>0.95</si:coverageProbability>
</si:expandedUnc>
</si:real>
<dcc:usedMethods>
<dcc:usedMethod>
<dcc:name>
<dcc:content>Method of density determination</dcc:content>
</dcc:name>
<dcc:norm>OIML R111-1:2004, section B. method F</dcc:norm>
</dcc:usedMethod>
</dcc:usedMethods>
<dcc:measurementMetaData>
<dcc:metaData refType="source">
<dcc:reference>Certificate XXXXX by yyyy dated YYYY-MM-DD</dcc:reference>
</dcc:metaData>
<dcc:metaData refType="conformity">
<dcc:norm>OIML R111-1:2004, section B. method F</dcc:norm>
<dcc:declaration>
<dcc:content>Simple acceptance</dcc:content>
</dcc:declaration>
<dcc:conformity>pass</dcc:conformity>
<dcc:data>
<dcc:quantity refType="maximumPermissibleError">
<si:real>
<si:value>10</si:value>
<si:unit>\kilogram\metre\tothe(-3)</si:unit>
</si:real>
</dcc:quantity>
```

```
</dcc:data>
</dcc:metaData>
</dcc:measurementMetaData>
</dcc:quantity>
</dcc:data>
</dcc:influenceCondition>

<dcc:influenceCondition refType="temperature">
<dcc:name>
<dcc:content lang="de">Temperatur</dcc:content>
<dcc:content long="en">temperature</dcc:content>
</dcc:name>
<dcc:data>
<dcc:quantity>
<si:real>
<si:value>294.05</si:value>
<si:unit>\kelvin</si:unit>
<si:expandedUnc>
<si:uncertainty>0.50</si:uncertainty>
<si:coverageFactor>2</si:coverageFactor>
<si:coverageProbability>0.95</si:coverageProbability>
</si:expandedUnc>
</si:real>
</dcc:quantity>
</dcc:data>
</dcc:influenceCondition>

<dcc:influenceCondition refType="airDensity">
<dcc:name>
<dcc:content lang="de">Luftdichte</dcc:content>
<dcc:content long="en">air density</dcc:content>
</dcc:name>
<dcc:data>
<dcc:quantity>
<si:real>
<si:value>1.1635</si:value>
<si:unit>\kilogram\metre\tothe(-3)</si:unit>
<si:expandedUnc>
<si:uncertainty>0.0035</si:uncertainty>
<si:coverageFactor>2</si:coverageFactor>
<si:coverageProbability>0.95</si:coverageProbability>
</si:expandedUnc>
</si:real>
</dcc:quantity>
</dcc:data>
</dcc:influenceCondition>

<dcc:influenceCondition refType="humidity">
<dcc:name>
<dcc:content lang="de">rel. Luftfeuchte</dcc:content>
<dcc:content long="en">relative humidity</dcc:content>
</dcc:name>
<dcc:data>
<dcc:quantity>
<si:real>
<si:value>0.417</si:value>
<si:unit>\one</si:unit>
<si:expandedUnc>
<si:uncertainty>0.020</si:uncertainty>
<si:coverageFactor>2</si:coverageFactor>
<si:coverageProbability>0.95</si:coverageProbability>
</si:expandedUnc>
</si:real>
</dcc:quantity>
</dcc:data>
```

```
</dcc:influenceCondition>

</dcc:influenceConditions>

<dcc:results>

<dcc:result refType="conventionalMass">
<dcc:name>
<dcc:content lang="de">Konventioneller Wägewert</dcc:content>
<dcc:content long="en">Conventional mass</dcc:content>
</dcc:name>
<dcc:data>

<dcc:quantity refType="nominalValue">
<dcc:name>
<dcc:content lang="de">Nennwert</dcc:content>
<dcc:content long="en">Nominal value</dcc:content>
</dcc:name>
<si:real>
<si:value>2</si:value>
<si:unit>\kilogram</si:unit>
</si:real>
</dcc:quantity>

<dcc:quantity refType="measurementValue">
<si:real>
<si:value>2.0000002</si:value>
<si:unit>\kilogram</si:unit>
<si:dateTime>2021-06-01T12:01:02</si:dateTime>
<si:expandedUnc>
<si:uncertainty>0.0000032</si:uncertainty>
<si:coverageFactor>2</si:coverageFactor>
<si:coverageProbability>0.95</si:coverageProbability>
</si:expandedUnc>
</si:real>

</dcc:quantity>
<dcc:quantity refType="measurementDeviation">
<si:real>
<si:value>0.0000002</si:value>
<si:unit>\kilogram</si:unit>
<si:dateTime>2021-06-01T12:01:02</si:dateTime>
<si:expandedUnc>
<si:uncertainty>0.0000032</si:uncertainty>
<si:coverageFactor>2</si:coverageFactor>
<si:coverageProbability>0.95</si:coverageProbability>
</si:expandedUnc>
</si:real>
<dcc:measurementMetaData>
<dcc:metaData refType="isInCMC">
<dcc:reference>D-K-xxxxx-yy-zz</dcc:reference>
<dcc:declaration>
<dcc:content lang="de">Dieser Wert ist innerhalb der Kalibrier- und
Messmöglichkeiten.</dcc:content>
<dcc:content long="en">This result is within the calibration and measurement
capabilities.</dcc:content>
</dcc:declaration>
<dcc:valid>true</dcc:valid>
<dcc:respAuthority>
<dcc:name>
<dcc:content>DAkkS</dcc:content>
</dcc:name>
<dcc:eMail>info@dakks.de</dcc:eMail>
<dcc:location>
<dcc:city>Braunschweig</dcc:city>
```

```
</dcc:location>
</dcc:respAuthority>
</dcc:metaData>
<dcc:metaData refType="conformity">
<dcc:convention>section 5.3.2</dcc:convention>
<dcc:norm>OIML R111-1:2004</dcc:norm>
<dcc:declaration>
<dcc:content>Binary, Guard banded acceptance w=U and TUR >=3</dcc:content>
</dcc:declaration>
<dcc:conformity>pass</dcc:conformity>
<dcc:data>
<dcc:quantity refType="maximumPermissibleError">
<si:real>
<si:value>0.000001</si:value>
<si:unit>\kilogram</si:unit>
</si:real>
</dcc:quantity>
</dcc:data>
</dcc:metaData>
</dcc:measurementMetaData>
</dcc:quantity>
</dcc:data>
</dcc:result>

<dcc:result refType="mass">
<dcc:name>
<dcc:content lang="de">Masse</dcc:content>
<dcc:content long="en">Mass</dcc:content>
</dcc:name>
<dcc:data>
<dcc:quantity refType="nominalValue">
<dcc:name>
<dcc:content lang="de">Nennwert</dcc:content>
<dcc:content long="en">Nominal value</dcc:content>
</dcc:name>
<si:real>
<si:value>2</si:value>
<si:unit>\kilogram</si:unit>
</si:real>
</dcc:quantity>

<dcc:quantity refType="measurementValue">
<si:real>
<si:value>1.9999998</si:value>
<si:unit>\kilogram</si:unit>
<si:dateTime>2021-06-01T12:01:02</si:dateTime>
<si:expandedUnc>
<si:uncertainty>0.0000032</si:uncertainty>
<si:coverageFactor>2</si:coverageFactor>
<si:coverageProbability>0.95</si:coverageProbability>
</si:expandedUnc>
</si:real>
</dcc:quantity>
</dcc:data>
</dcc:result>
</dcc:results>
</dcc:measurementResult>
</dcc:measurementResults>
```

Appendix C Example of a digital calibration certificate for a set consisting of two weights

```
<?xml version="1.0" encoding="UTF-8"?>

<dcc:digitalCalibrationCertificate
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:schemaLocation="https://ptb.de/dcc https://ptb.de/dcc/v3.0.0/dcc.xsd"
xmlns:dcc="https://ptb.de/dcc"
xmlns:si="https://ptb.de/si" schemaVersion="3.0.0">

<!--This is an example for a set of weights consiting of two weights. The example
has been created by DKD’s Technical Committee Mass and Weighing Instruments.
Version of the example: V1.3 , Date: 19.04.2022  -->

<dcc:administrativeData>
<dcc:dccSoftware>
<dcc:software>
<dcc:name>
<dcc:content>WebStorm</dcc:content>
</dcc:name>
<dcc:release>2019.1.3</dcc:release>
</dcc:software>
</dcc:dccSoftware>

<dcc:coreData>
<dcc:countryCodeISO3166_1>DE</dcc:countryCodeISO3166_1>
<dcc:usedLangCodeISO639_1>de</dcc:usedLangCodeISO639_1>
<dcc:usedLangCodeISO639_1>en</dcc:usedLangCodeISO639_1>
<dcc:mandatoryLangCodeISO639_1>de</dcc:mandatoryLangCodeISO639_1>
<dcc:uniqueIdentifier>Example calibration</dcc:uniqueIdentifier>
<dcc:identifications>
<dcc:identification>
<dcc:issuer>calibrationLaboratory</dcc:issuer>
<dcc:value>437000111</dcc:value>
<dcc:name>
<dcc:content lang="de">SAP-Nummer</dcc:content>
<dcc:content long="en">SAP-Number</dcc:content>
</dcc:name>
</dcc:identification>
<dcc:identification>
<dcc:issuer>owner</dcc:issuer>
<dcc:value>06.02.03#0001</dcc:value>
<dcc:name>
<dcc:content lang="de">Aktennummer</dcc:content>
<dcc:content long="en">File number</dcc:content>
</dcc:name>
</dcc:identification>
</dcc:identifications>
<dcc:beginPerformanceDate>2021-06-01</dcc:beginPerformanceDate>
<dcc:endPerformanceDate>2021-06-02</dcc:endPerformanceDate>
<dcc:performanceLocation>laboratory</dcc:performanceLocation>
</dcc:coreData>

<dcc:items>
<dcc:name>
<dcc:content lang="de">1 Gewichtssatz mit 2 Gewichten, 1 kg und 2 kg</dcc:content>
<dcc:content long="en">1 set of weights with 2 weights, 1 kg and 2 kg</dcc:content>
</dcc:name>
<dcc:equipmentClass>
<dcc:reference>OIML R111-1:2004</dcc:reference>
<dcc:classID>E2</dcc:classID>
</dcc:equipmentClass>
<dcc:description>
```

```
<dcc:content lang="de">Aufbewahrung Die Gewichtstücke befinden sich in einem Kasten
aus lackiertem Holz; das Kalibrierzeichen ist auf dem Kasten
aufgebracht.</dcc:content>
<dcc:content long="en">Case The weights are accommodated in a box of varnished
wood; the calibration mark is applied to the box.</dcc:content>
</dcc:description>
<dcc:identifications>
<dcc:identification refType="weightSetID">
<dcc:issuer>owner</dcc:issuer>
<dcc:value>123-123</dcc:value>
<dcc:name>
<dcc:content lang="de">Identifikationsnummer</dcc:content>
<dcc:content long="en">Identification Number</dcc:content>
</dcc:name>
</dcc:identification>
<dcc:identification refType="serialNoWeightSet">
<dcc:issuer>manufacturer</dcc:issuer>
<dcc:value>xyz1234567</dcc:value>
<dcc:name>
<dcc:content lang="de">Seriennummer</dcc:content>
<dcc:content long="en">Serial Number</dcc:content>
</dcc:name>
</dcc:identification>
<dcc:identification refType="manufacturingDate">
<dcc:issuer>manufacturer</dcc:issuer>
<dcc:value>UTC 2020-01-01 19:35:50</dcc:value>
<dcc:name>
<dcc:content lang="de">Herstellungsdatum</dcc:content>
<dcc:content long="en">Manufacturing Date</dcc:content>
</dcc:name>
</dcc:identification>
</dcc:identifications>

<dcc:item id="weightABC5678">
<dcc:name>
<dcc:content lang="de">1 kg</dcc:content>
<dcc:content long="en">1 kg</dcc:content>
</dcc:name>
<dcc:description>
<dcc:content lang="de">Beschreibung der Verpackung (optional)</dcc:content>
<dcc:content lang="en">Description of box/case (optional)</dcc:content>
</dcc:description>
<dcc:manufacturer>
<dcc:name>
<dcc:content>Weights Co Ltd.</dcc:content>
</dcc:name>
</dcc:manufacturer>
<dcc:identifications>
<dcc:identification refType="manufacturingDate">
<dcc:issuer>manufacturer</dcc:issuer>
<dcc:value>UTC 2020-01-01 19:37:10</dcc:value>
<dcc:name>
<dcc:content lang="de">Herstellungsdatum</dcc:content>
<dcc:content lang="en">Manufacturing Date</dcc:content>
</dcc:name>
</dcc:identification>
<dcc:identification refType="setPosition">
<dcc:issuer>owner</dcc:issuer>
<dcc:value>ABC5678</dcc:value>
<dcc:name>
<dcc:content lang="de">Interne Nummer der Elementposition</dcc:content>
<dcc:content lang="en">Internal number of the element position</dcc:content>
</dcc:name>
</dcc:identification>
<dcc:identification refType="objectId">
```

```
<dcc:issuer>owner</dcc:issuer>
<dcc:value>XYZ0123</dcc:value>
<dcc:name>
<dcc:content lang="de">Datenbanknummer des Gewichts</dcc:content>
<dcc:content long="en">Database number of the weight</dcc:content>
</dcc:name>
</dcc:identification>
<dcc:identification refType="shape">
<dcc:issuer>manufacturer</dcc:issuer>
<dcc:value>Knob weight</dcc:value>
<dcc:name>
<dcc:content lang="de">Form</dcc:content>
<dcc:content long="en">Form</dcc:content>
</dcc:name>
</dcc:identification>
<dcc:identification refType="material">
<dcc:issuer>manufacturer</dcc:issuer>
<dcc:value>Stainless Steel</dcc:value>
<dcc:name>
<dcc:content lang="de">Material</dcc:content>
<dcc:content long="en">Material</dcc:content>
</dcc:name>
</dcc:identification>
<dcc:identification refType="differentiator">
<dcc:issuer>manufacturer</dcc:issuer>
<dcc:value>**</dcc:value>
<dcc:name>
<dcc:content lang="de">Zusatzindentifikation</dcc:content>
<dcc:content long="en">Additional identification</dcc:content>
</dcc:name>
</dcc:identification>
<dcc:identification refType="userMarking1">
<dcc:issuer>owner</dcc:issuer>
<dcc:value>214</dcc:value>
<dcc:name>
<dcc:content lang="de">Nutzermarkierung 1</dcc:content>
<dcc:content long="en">User marking 1</dcc:content>
</dcc:name>
</dcc:identification>
<dcc:identification refType="userMarking2">
<dcc:issuer>owner</dcc:issuer>
<dcc:value>ABC</dcc:value>
<dcc:name>
<dcc:content lang="de">Nutzermarkierung 2</dcc:content>
<dcc:content long="en">User marking 2</dcc:content>
</dcc:name>
</dcc:identification>
</dcc:identifications>
</dcc:item>

<dcc:item id="weightABC1234">
<dcc:name>
<dcc:content lang="de">2 kg</dcc:content>
<dcc:content long="en">2 kg</dcc:content>
</dcc:name>
<dcc:equipmentClass>
<dcc:reference>OIML R111-1:2004</dcc:reference>
<dcc:classID>E2</dcc:classID>
</dcc:equipmentClass>
<dcc:description>
<dcc:content lang="de">Beschreibung der Verpackung (optional)</dcc:content>
<dcc:content lang="en">Description of box/case (optional)</dcc:content>
</dcc:description>
<dcc:manufacturer>
<dcc:name>
```

```
<dcc:content>Weights Co Ltd.</dcc:content>
</dcc:name>
</dcc:manufacturer>
<dcc:identifications>
<dcc:identification refType="manufactoringDate">
<dcc:issuer>manufacturer</dcc:issuer>
<dcc:value>UTC 2020-01-01 19:35:50</dcc:value>
<dcc:name>
<dcc:content lang="de">Herstellungsdatum</dcc:content>
<dcc:content long="en">Manufacturing Date</dcc:content>
</dcc:name>
</dcc:identification>
<dcc:identification refType="setPosition">
<dcc:issuer>owner</dcc:issuer>
<dcc:value>ABC1234</dcc:value>
<dcc:name>
<dcc:content lang="de">Interne Nummer der Elementposition</dcc:content>
<dcc:content long="en">Internal number of the element position</dcc:content>
</dcc:name>
</dcc:identification>
<dcc:identification refType="objectId">
<dcc:issuer>owner</dcc:issuer>
<dcc:value>XYZ4567</dcc:value>
<dcc:name>
<dcc:content lang="de">Datenbanknummer des Gewichts</dcc:content>
<dcc:content long="en">Database number of the weight</dcc:content>
</dcc:name>
</dcc:identification>
<dcc:identification refType="shape">
<dcc:issuer>manufacturer</dcc:issuer>
<dcc:value>Knob weight</dcc:value>
<dcc:name>
<dcc:content lang="de">Form</dcc:content>
<dcc:content long="en">Form</dcc:content>
</dcc:name>
</dcc:identification>
<dcc:identification refType="material">
<dcc:issuer>manufacturer</dcc:issuer>
<dcc:value>Stainless Steel</dcc:value>
<dcc:name>
<dcc:content lang="de">Material</dcc:content>
<dcc:content long="en">Material</dcc:content>
</dcc:name>
</dcc:identification>
<dcc:identification refType="differentiator">
<dcc:issuer>manufacturer</dcc:issuer>
<dcc:value>*</dcc:value>
<dcc:name>
<dcc:content lang="de">Zusatzindentifikation</dcc:content>
<dcc:content long="en">Additional identification</dcc:content>
</dcc:name>
</dcc:identification>
<dcc:identification refType="userMarking1">
<dcc:issuer>owner</dcc:issuer>
<dcc:value>321</dcc:value>
<dcc:name>
<dcc:content lang="de">Nutzermarkierung 1</dcc:content>
<dcc:content long="en">User marking 1</dcc:content>
</dcc:name>
</dcc:identification>
<dcc:identification refType="userMarking2">
<dcc:issuer>owner</dcc:issuer>
<dcc:value>CBA</dcc:value>
<dcc:name>
<dcc:content lang="de">Nutzermarkierung 2</dcc:content>
```

```
<dcc:content long="en">User marking 2</dcc:content>
</dcc:name>
</dcc:identification>
</dcc:identifications>
</dcc:item>
</dcc:items>

<dcc:calibrationLaboratory>
<dcc:contact>
<dcc:name>
<dcc:content>Physikalisch-Technische Bundesanstalt (PTB)</dcc:content>
</dcc:name>
<dcc:eMail>info@ptb.de</dcc:eMail>
<dcc:location>
<dcc:further id="zusatz">
<dcc:content lang="de">Abteilung 1 Mechanik und Akustik</dcc:content>
<dcc:content long="en">Division 1 Mechanics and Acoustics</dcc:content>
</dcc:further>
<dcc:street>Bundesallee</dcc:street>
<dcc:streetNo>100</dcc:streetNo>
<dcc:postCode>38116</dcc:postCode>
<dcc:city>Braunschweig</dcc:city>
<dcc:countryCode>DE</dcc:countryCode>
</dcc:location>
</dcc:contact>
</dcc:calibrationLaboratory>

<dcc:respPersons>
<dcc:respPerson>
<dcc:person>
<dcc:name>
<dcc:content>Michael</dcc:content>
</dcc:name>
<dcc:eMail>info@ptb.de</dcc:eMail>
</dcc:person>
<dcc:role>authorisation of certificate</dcc:role>
</dcc:respPerson>
<dcc:respPerson>
<dcc:person>
<dcc:name>
<dcc:content>Alexander</dcc:content>
</dcc:name>
<dcc:eMail>info@ptb.de</dcc:eMail>
</dcc:person>
</dcc:respPerson>
</dcc:respPersons>

<dcc:customer>
<dcc:name>
<dcc:content>Customer</dcc:content>
</dcc:name>
<dcc:eMail>info@ptb.de</dcc:eMail>
<dcc:location>
<dcc:streetNo>6</dcc:streetNo>
<dcc:street>Hello Street</dcc:street>
<dcc:postCode>10</dcc:postCode>
<dcc:city>Braunschweig</dcc:city>
<dcc:countryCode>DE</dcc:countryCode>
</dcc:location>
</dcc:customer>

<dcc:statements>

<dcc:statement>
<dcc:norm>DIN EN ISO/IEC 17025:2018-03</dcc:norm>
```

```
<dcc:reference>7.8.2.1 l)</dcc:reference>
<dcc:declaration>
<dcc:content lang="de">Die Ergebnisse beziehen sich nur auf den in diesem DCC
beschriebenen Gegenstand.</dcc:content>
<dcc:content long="en">The results refer only to the object calibrated in this
DCC.</dcc:content>
</dcc:declaration>
</dcc:statement>

<dcc:statement refType="isInCMC">
<dcc:convention>CIPM-MRA</dcc:convention>
<dcc:declaration>
<dcc:content lang="de">Alle angegebenen Ergebnisse sind innerhalb der Kalibrier-
und Messmöglichkeiten</dcc:content>
<dcc:content long="en">All reported results are within the calibration and
measurement capabilities.</dcc:content>
</dcc:declaration>
<dcc:valid>true</dcc:valid>
</dcc:statement>

<dcc:statement>
<dcc:convention>Tracebility</dcc:convention>
<dcc:traceable>true</dcc:traceable>
<dcc:declaration>
<dcc:content lang="de">Die Messung ist auf das SI rückführbar.</dcc:content>
<dcc:content long="en">The measurement is traceable to the SI.</dcc:content>
</dcc:declaration>
</dcc:statement>

<dcc:statement>
<dcc:norm>DIN EN ISO/IEC 17025:2018-03</dcc:norm>
<dcc:reference>7.8.4.3</dcc:reference>
<dcc:declaration>
<dcc:content lang="de">Die Ergebnisse gelten zum Zeitpunkt der Kalibrierung. Es
obliegt dem Verwender, zu gegebener Zeit eine Rekalibrierung zu
veranlassen.</dcc:content>
<dcc:content long="en">The results refer only to the object calibrated in this DCC.
The measurement results are valid at the time of calibration. The user is
responsible for arranging a recalibration in due time.</dcc:content>
</dcc:declaration>
</dcc:statement>

</dcc:statements>

</dcc:administrativeData>

<dcc:measurementResults>

<dcc:measurementResult refId="weightABC1234">

<dcc:name>
<dcc:content>Mass calibration</dcc:content>
</dcc:name>

<dcc:usedMethods>

<dcc:usedMethod refType="conventionalMass">
<dcc:name>
<dcc:content lang="de">Bestimmung des konventionellen Wägewerts</dcc:content>
<dcc:content long="en">Determination of the conventional weighing
value</dcc:content>
</dcc:name>
<dcc:norm>OIML R111-1:2004</dcc:norm>
</dcc:usedMethod>
```

```
<dcc:usedMethod refType="mass">
<dcc:name>
<dcc:content lang="de">Verwendete Methode der Massekalibrierung</dcc:content>
<dcc:content long="en">Used method of True Mass calibration</dcc:content>
</dcc:name>
<dcc:norm>OIML R111-1:2004</dcc:norm>
</dcc:usedMethod>

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value</dcc:content>
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38116 Braunschweig

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