Digital Calibration Certificate

The DCC was first presented in the following publication[1].
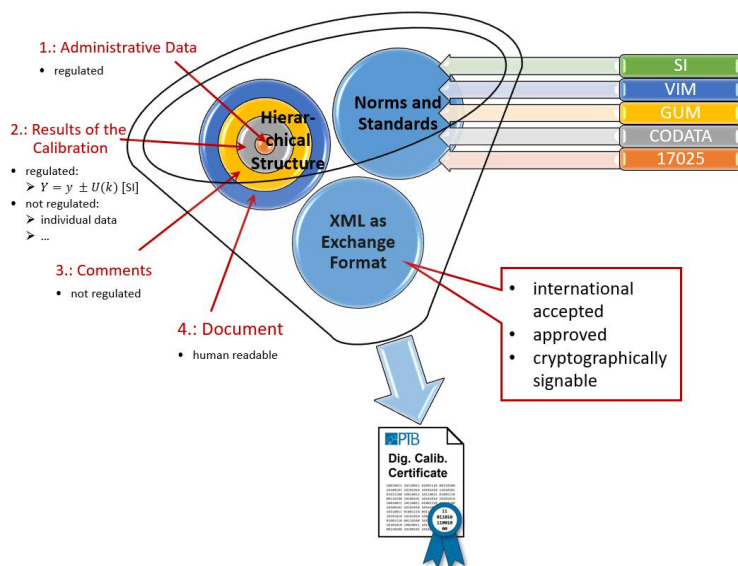
Flyer

The following one-page flyer gives a rough overview about the DCC: Flyer
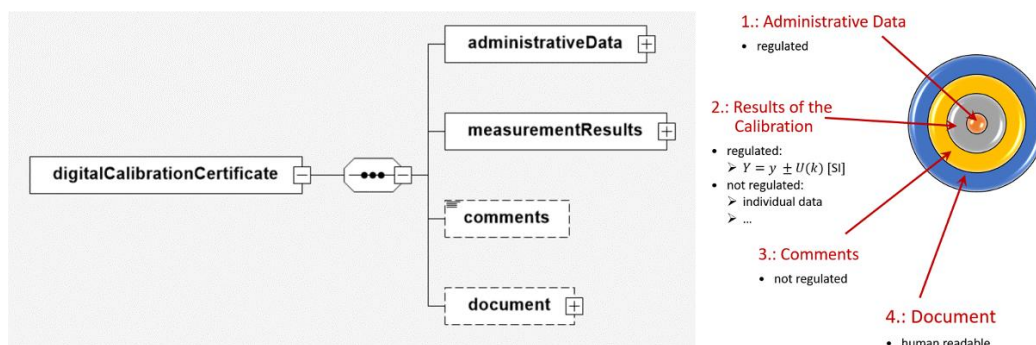
The flyer is currently available in Chinese, German, English, French, Korean, Portuguese, Russian and Spanish.

Structure

The following figure shows the main structure of the Digital Calibration Certificate (DCC):

The ring structure of the DCC from the figure is also shown in the DCC XML Sheam:

chart software

The root element of the DCC is the element dcc:digitalCalibrationCertificate. Thus a condition of DIN EN ISO/IEC 17025:2018-03 [2] is also fulfilled, which calls for a title in Section 7.8.2.1.a.

1. *Siegfried Hackel, Frank Härtig, Julia Hornig, Thomas Wiedenhöfer: The Digital Calibration Certificate, PTB-Mitteilungen 127 (2017), Heft 4, doi: 10.7795/310.20170403* ↩

2. DIN EN ISO/IEC 17025:2018-03 General requirements for the competence of testing and calibration laboratories ↩
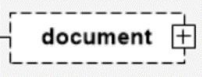
XSD Diagram Viewer

Source

For the representation of the structure of the DCC schema we use two different software tools. For simple structures the software *XSD Diagram* [1] is used. If it is important to display more information, such as the type of data used for an element or its attributes, we use *Altova XMLSpy 2018* [2] software. These representations are marked with the software hint.

Nomenclature
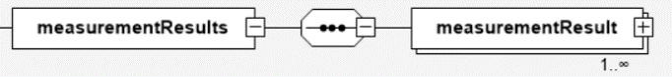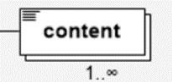
Frequency of elements

XML elements can occur different times. To do this, XSD Diagram uses the option the following nomenclature:
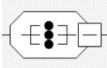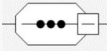
exactly 1:		
1 to unbounded:		Other entries are also possible, e.g. 0 - unbounded times or 3 to 7 times.
0 or 1:		

Child elements

If an element has child elements, there is a link on the right side with a "+". If you click on it, you will see the elements of the next level.

collapsed:	
opened:	
Element without Child:	

Arrangement and selection of child elements

The child elements can be arranged in **any order**.	
The child elements must be arranged in the **current order**.	
Exactly **one** child element must be selected.	

Recursively called elements,
here as an example the element *dcc:hash* - are displayed as follows:

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1. *XSD Diagram is a free xml schema definition diagram viewer (http://regis.cosnier.free.fr). Version 1.2 Copyright (c) 2006-2018 Regis Cosnier, All Rights Reserved. This program is free software and may be distributed according to the terms of the GNU General Public License (GPL).* ↵

2. XMLSpy Verion 2018 des Herstellers Altova GmbH, Rudolfsplatz 13a/9, A-1010 Wien https://www.altova.com/de/xmlspy-xml-editor ↵

The Root element and it is elements

The Root element *digitalCalibrationCertificate* has four elements:
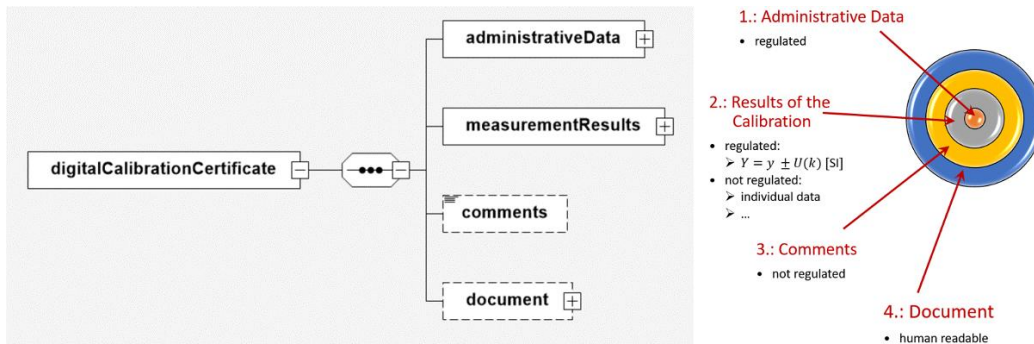
Rough description of the function of the four elementsw

dcc:administrativeData (Ring 1)

The *administrativeData* element contains alls the essential administrative information for calibration. The entries in this area are basically the same and regulated in all DCCs.

dcc:measurementResult (Ring 2)

The *measurementResult* element stores all information on the result of the measurement. The measurement and result data must have a value and a unit. Ideally, the unit is a SI unit.

Because of the different calibration requirements in the individual areas, the DCCs are different to each other. It is therefore logical that DCC's in the field of acoustics differ from those in the field of cyclotron radiation.

dcc:comments (Ring 3)

All further information and files agreed between the customer and the calibration laboratory can be inserted into this element. Files of various types (e.g. results from spreadsheet programs) are converted using the Base64 method [1] so that they can be stored in the XML structure. They can then be removed from the XML structure and converted back without errors using the Base64 method.

dcc:document (Ring 4)

The element *document* contains the human-readable variant of the DCC.

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1. https://tools.ietf.org/html/rfc4648 ↩

dcc:administrativeData

The element *dcc:administrativeData* contains all essential administrative information for calibration. The entries in this area are basically the same and regulated in all DCCs.

Tree structure

The tree structure of the element *dcc:administrativeData* has the following layout:
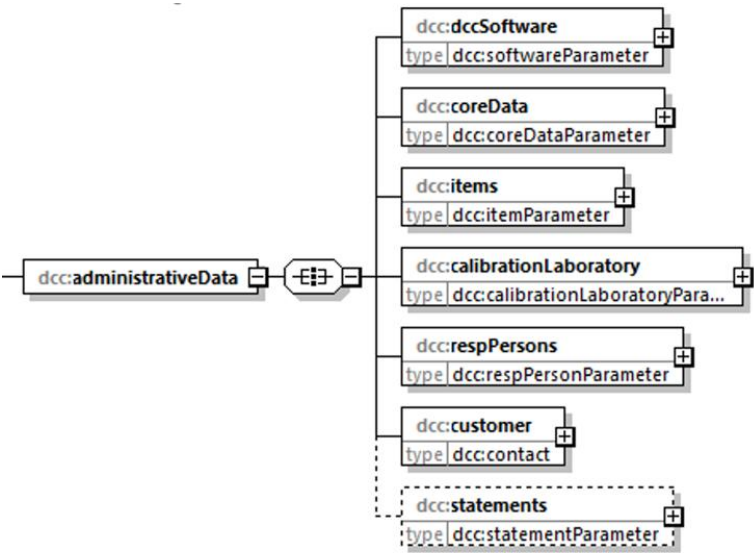
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Extract from the XML Schema

```xml
<xs:element name="administrativeData">
    <xs:complexType>
        <xs:all>
            <xs:element name="dccSoftware" type="dcc:softwareParameter" />
            <xs:element name="coreData" type="dcc:coreDataParameter"/>
            <xs:element name="items" type="dcc:itemParameter"/>
            <xs:element name="calibrationLaboratory" type="dcc:calibrationLaboratoryParameter"/>
            <xs:element name="respPersons" type="dcc:respPersonParameter"/>
            <xs:element name="customer" type="dcc:contact"/>
            <xs:element name="statements" type="dcc:statementParameter" minOccurs="0"/>
        </xs:all>
    </xs:complexType>
</xs:element>
```

Completion instructions

For more information on the completion instructions, see the Elements subsection.

Minimum requirements

[R] Required	[O] Optional	[R|O] Required | Optional

This is a mandatory field.	This is an optional field.	This field may be mandatory, depending on the application.

Elements

Element		Note
dcc:dccSoftware	[R]	Essential information for identifying the software used to create and edit the DCC is stored here.
dcc:coreData	[R]	Essential information for the identification of the material to be calibrated as well as the global classification of the calibration certificate.
dcc:items	[R]	Unique identification, description and, if applicable, condition of the calibration object.
dcc:calibrationLaboratory	[R]	Essential information for the identification of the calibration laboratory.
dcc:respPersons	[R]	Identification of the person(s) responsible for releasing the report.
dcc:customer	[R]	Identification of the calibration client.
dcc:statements	[O]	Element for entering various statements.

dcc:measurementResults

(in development)

The element *dcc:measurementResults* contains all results of the measurements, evaluations and information for calibration. The entries in this area are always such that a value is always linked to a unit. SI units should always be used.

Tree structure

The tree structure of the element *dcc:measurementResults* has the following layout:
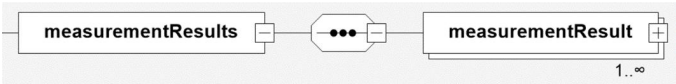
chart software

Completion instructions

For more information on the completion instructions, see the Elements subsection.

Minimum requirements

[R] Required	[O] Optional	[R|O] Required | Optional
This is a mandatory field.	This is an optional field.	This field may be mandatory, depending on the application.

Elements

The element *dcc:measurementResults* has only the child element *dcc:measurementResult*.

Element		Note
dcc:measurementResult	[R]	The element *dcc:measurementResult* can be called any number of times.

dcc:comments

All further information and files agreed between the customer and the calibration laboratory can be inserted into this element. Files of various types (e.g. results from spreadsheet programs) are converted using the Base64 method [^1] so that they can be stored in the XML structure. They can then be removed from the XML structure and converted back without errors using the Base64 method.

dcc:document

The element document contains the human readable variant of the DCC.

All further information and files agreed between the customer and the calibration laboratory can be inserted into this element. Files of various types (e.g. results from spreadsheet programs) are converted using the Base64 method [^1] so that they can be stored in the XML structure. They can then be removed from the XML structure and converted back without errors using the Base64 method.

dcc:dccSoftware

Essential information for identifying the software used to create and edit the DCC is stored here.

Which software (with version information) was used for the creation. Conclusions can be drawn from this if the XML is incorrect. This information is immensely important for troubleshooting, for example.

Tree structure

The tree structure of the element *dcc:dccSoftware* results from the element type *dcc:SoftwareParameter*. It has the following layout:
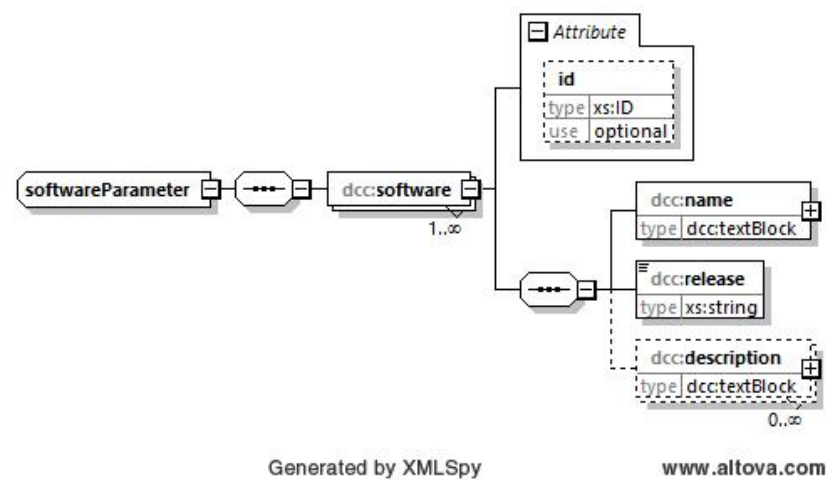
chart software

Rough structure of data type *dcc:softwareParameter* of element *dcc:software*

```xml
<xs:complexType name="softwareParameter">
    <xs:sequence>
        <xs:element name="software" maxOccurs="unbounded">
            <xs:complexType>
                <xs:sequence>
                    <xs:element name="name" type="dcc:textBlock"/>
                    <xs:element name="release" type="xs:string"/>
                    <xs:element name="description" type="dcc:textBlock" minOccurs="0"
                    maxOccurs="unbounded" />
                </xs:sequence>
                <xs:attribute name="id" type="xs:ID" use="optional"/>
            </xs:complexType>
        </xs:element>
    </xs:sequence>
</xs:complexType>
```

Completion instructions

The DCC XML file is created with software. The use of this software (one or more) must be documented. Further information on the completion instructions can be found in the Elements subsection.

Minimum requirements

[R] **Required**	**[O]** **Optional**	**[R|O]** **Required | Optional**
This is a mandatory field.	This is an optional field.	This field may be mandatory, depending on the application.

Elements

Element		Note
dcc:software	[R]	The element *dcc:software* may occur multiple times. Each entry represents exactly one software that was used to create the XML file.
dcc:name dcc:textBlock	[R]	The name of the software is entered in this element. It can be specified in several languages.
dcc:release xs:string	[R]	The release of the software. Possible specifications: Release, version, etc. This serves to uniquely identify the software in connection with the name.
dcc:description dcc:textBlock	[O]	Other information not specified in the *dcc:name* or *dcc:release* elements can be specified here. The element can occur not at all, once or multiple times. Due to the data type textBlock, multilingualism is also given here.

Attributes

Attribut	Comment
xs:ID xs:ID	This standard dataType of XML is used to represent a unique ID. It is used to uniquely identify the object in the DCC. The data type xs:ID is deliberately used here, as this enables validation without any add-ons in different tools.

Examples

The examples are excerpts from DCC's.

Example 1

In this example a software (Notepad++) is used for the creation of the DCC. Only the mandatory fields are filled in. Here is the result:

```
<dcc:dccSoftware>
    <dcc:software>
        <dcc:name>
            <dcc:content>Notepad++ (32-bit)</dcc:content>
        </dcc:name>
        <dcc:release>v7.7.1</dcc:release>
    </dcc:software>
</dcc:dccSoftware>
```

Example 2

On the basis of example 1 further information is given:

```
<dcc:dccSoftware>
    <dcc:software>
        <dcc:name>
            <dcc:content>Notepad++ (32-bit)</dcc:content>
        </dcc:name>
        <dcc:release>v7.7.1</dcc:release>
```

```xml
        <dcc:description>
            <dcc:content>Erweiterung: XML Tools Plugin version 2.3.2 unicode beta4 r908
            </dcc:content>
        </dcc:description>
        <dcc:description>
            <dcc:content>Installation aus dem Softwarecenter</dcc:content>
        </dcc:description>
    </dcc:software>
</dcc:dccSoftware>
```

Example 3

Like example 2, but in German and English:

```xml
<dcc:dccSoftware>
    <dcc:software>
        <dcc:name>
            <dcc:content>Notepad++ (32-bit)</dcc:content>
        </dcc:name>
        <dcc:release>v7.7.1</dcc:release>
        <dcc:description>
            <dcc:content lang="de">Erweiterung: XML Tools Plugin version 2.3.2 unicode beta4 r908
            </dcc:content>
            <dcc:content lang="en">Extension: XML Tools Plugin version 2.3.2 unicode beta4 r908
            </dcc:content>
        </dcc:description>
        <dcc:description>
            <dcc:content lang="de">Installation aus dem Softwarecenter</dcc:content>
            <dcc:content lang="en">Installation from the Software Cente</dcc:content>
        </dcc:description>
    </dcc:software>
</dcc:dccSoftware>
```

Example 4

As example 3, additionally with ID's:

```xml
<dcc:dccSoftware>
    <dcc:software id="Notepad_plusplus">
        <dcc:name>
            <dcc:content>Notepad++ (32-bit)</dcc:content>
        </dcc:name>
        <dcc:release>v7.7.1</dcc:release>
        <dcc:descriptionn id="dcc44-1">
            <dcc:content lang="de">Erweiterung: XML Tools Plugin version 2.3.2 unicode beta4 r908
            </dcc:content>
            <dcc:content lang="en">Extension: XML Tools Plugin version 2.3.2 unicode beta4 r908
            </dcc:content>
        </dcc:description>
        <dcc:descriptionn id="dcc44-2">
            <dcc:content lang="de">Installation aus dem Softwarecenter</dcc:content>
            <dcc:content lang="en">Installation from the Software Cente</dcc:content>
        </dcc:description>
    </dcc:software>
</dcc:dccSoftware>
```

dcc:coreData

The element *dcc:coreData* contains essential information on the global classification of the calibration.

Tree structure

The tree structure of the element *dcc:coreData* results from the element type *dcc:coreDataParameter*. It has the following layout:

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Rough structure of element type *dcc:coreDataParameter* of element *coreData*

```xml
<xs:complexType name="coreDataParameter">
    <xs:sequence>
        <xs:element name="countryCodeISO3166_1" type="dcc:elementStringISO3166"/>
        <xs:element name="usedLangCodeISO639_1" type="dcc:elementStringISO639"
        maxOccurs="unbounded"/>
        <xs:element name="mandatoryLangCodeISO639_1" type="dcc:elementStringISO639"
        maxOccurs="unbounded"/>
        <xs:element name="uniqueIdentifier" type="xs:string"/>
        <xs:element name="receiptDate" type="xs:date" minOccurs="0"/>
        <xs:element name="beginPerformanceDate" type="xs:date" />
        <xs:element name="endPerformanceDate" type="xs:date"/>
        <xs:element name="previousReport" type="dcc:hash" minOccurs="0"/>
    </xs:sequence>
</xs:complexType>
```
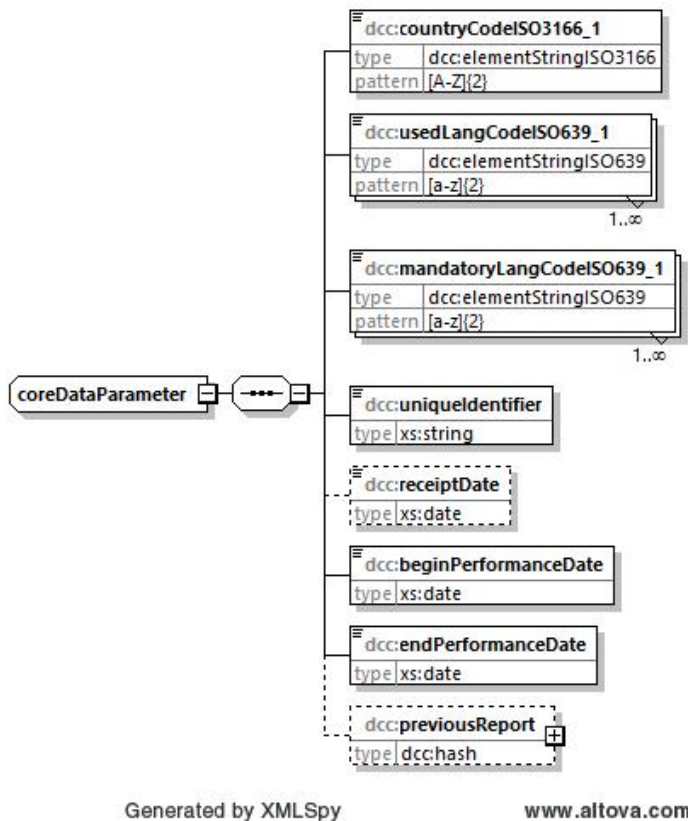
Completion instructions

For more information on the completion instructions, see the Elements subsection.

Minimum requirements

[R] Required	[O] Optional	[R|O] Required | Optional
This is a mandatory field.	This is an optional field.	This field may be mandatory, depending on the application.

PTB
PTB-specific entries are identified by the PTB logo.

Elemente

Element		Note
dcc:countryCodeISO3166_1 dcc:elementStringISO3166	[R]	In which country was the calibration carried out? The information is given in the country code defined in ISO 3166 (two capital letters). You will find more detailed information in the description of the data type. 🏴 PTB `<countryCodeISO3166_1>DE</countryCodeISO3166_1>`

dcc:langCodeISO639_1
dcc:elementStringISO639_1
	[R]	Indication of the official language(s) in which the DCC was drawn up. The code for the official languages as defined in ISO 639 (two lower-case letters). You will find more detailed information in the description of the data type.
		
		🏴 PTB
		
		In Germany and at PTB, DCC's are very often issued in German (de) and English (en):
		`<langCodeISO639_1>de</langCodeISO639_1>`
		`<langCodeISO639_1>en</langCodeISO639_1>`

dcc:mandatoryLangISO639_1 dcc:elementStringISO639	[R]	Determination of the official language(s) to be used in case of doubt. The information is given in the code for the official languages (two lower-case letters) laid down in ISO 639. You will find more detailed information in the description of the data type. 🏴 PTB In Germany and at the PTB, German (de) is very often given: `<mandatoryLangISO639_1>de</mandatoryLangISO639_1>`
dcc:uniqueIdentifier xs:string	[R]	A globally unique identifier for the DCC (calibration certificate number) must be specified here. The necessary condition for this is that the identifier is unique in the organisation in which the calibration laboratory is located. Reference is made to Issue #62.
dcc:receiptDate xs:date	[O|R]	Date of receipt of the calibration object. The date shall be indicated if it has a temporal influence on the calibration result.
dcc:beginPerformanceDate xs:date	[R]	Date at the start of the laboratory activity. DIN EN ISO/IEC 17025:2018-03 [1] specifies that the date or period of calibration is an essential part of a calibration certificate. Therefore the elements beginPerformanceDate and endPerformanceDate have to be filled in. If the calibration is performed on one day, the same date must be entered in both elements.
dcc:endPerformanceDate	[R]	Date at the end of the laboratory activity. DIN EN ISO/IEC 17025:2018-03 [1:1] specifies that the date or period of calibration is an essential part of a calibration certificate. Therefore the elements

xs:date [↗]		beginPerformanceDate and endPerformanceDate have to be filled in. If the calibration is performed on one day, the same date must be entered in both elements.
dcc:previousReport dcc:hash	[O]	The *dcc:previousReport* element allows you to refer to the previous calibration certificate replaced by this DCC. A chain of calibration certificates can be specified.

Examples

The following examples do not use the *dcc:previousReport* element. This Examples can be found in the wiki of *previousReport*.

Example 1

The DCC was exhibited in Switzerland. The language used, and thus logically the language that applies in case of doubt, is German. The unique identification number (the calibration certificate number) is "1234" and the calibration was carried out on 2002-09-25.

```
<coreData>
    <countryCodeISO3166_1>CH</countryCodeISO3166_1>
    <langCodeISO639_1>de</langCodeISO639_1>
    <mandatoryLangISO639_1>de</mandatoryLangISO639_1>
    <uniqueIdentifier>1234</uniqueIdentifier>
    <beginPerformanceDate>2002-09-25</beginPerformanceDate>
    <endPerformanceDate>2002-09-25</endPerformanceDate>
</coreData>
```

Example 2

The DCC was exhibited in Belgium. The languages used are French, Dutch and German. French and Dutch are valid languages in case of doubt. The unique identification number (the calibration certificate number) is "5678" and calibration started on 2002-07-25 and ended on 2002-07-27.

```
<coreData>
    <countryCodeISO3166_1>BE</countryCodeISO3166_1>
    <langCodeISO639_1>fr</langCodeISO639_1>
    <langCodeISO639_1>nl</langCodeISO639_1>
    <langCodeISO639_1>de</langCodeISO639_1>
    <mandatoryLangISO639_1>fr</mandatoryLangISO639_1>
    <mandatoryLangISO639_1>nl</mandatoryLangISO639_1>
    <uniqueIdentifier>5678</uniqueIdentifier>
    <receiptDate>2002-09-10</receiptDate>
    <beginPerformanceDate>2002-07-25</beginPerformanceDate>
    <endPerformanceDate>2002-07-27</endPerformanceDate>
</coreData>
```

1. DIN EN ISO/IEC 17025:2018-03 General requirements for the competence of testing and calibration laboratories ↩ ↩

dcc:items

The element *dcc:items* contains all necessary information to identify and describe a set of calibration items or a single calibration item. The element with its child elements can represent a complex composition. Therefore the rough structure of the element is shown in this part of the Wiki. For a more detailed subdivision, please refer to the links. In this part of the wiki we refer to the closer examination of the element item on a further wiki.

Tree structure

The tree structure of the element *dcc:items* results from the element type *dcc:itemParameter*. It has the following layout:

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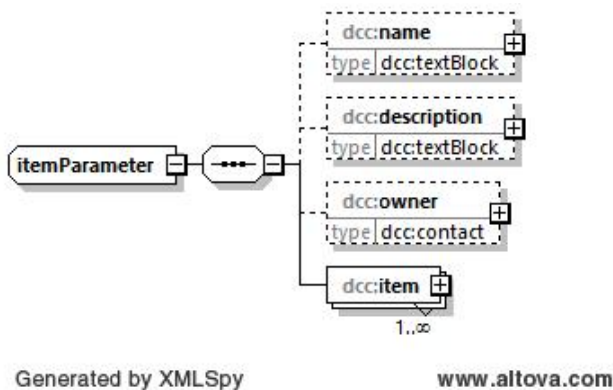
chart software

Structure in the XML Schema

Note

For reasons of illustration, the sub-elements of the subordinate element are not displayed here. The following XML line is used as placeholders.

```xml
<xs:element name="item" maxOccurs="unbounded"></xs:element>
```

The Wiki for the element *dcc.item* can be found here: dcc:item

Rough structure of element type *dcc:itemParameter* of element *dcc:items*

```xml
<xs:complexType name="itemParameter">
    <xs:sequence>
        <xs:element name="name" type="dcc:textBlock" minOccurs="0"/>
        <xs:element name="description" type="dcc:textBlock" minOccurs="0"/>
        <xs:element name="owner" type="dcc:contact" minOccurs="0"/>
        <xs:element name="item" maxOccurs="unbounded"></xs:element>
    </xs:sequence>
</xs:complexType>
```

Completion instructions

For more information on the completion instructions, see the Elements subsection.

Minimum requirements

[R] Required	[O] Optional	[R|O] Required | Optional
This is a mandatory field.	This is an optional field.	This field may be mandatory, depending on the application.

Elements

Element		Note
dcc:name dcc:textBlock	[O]	This element contains the name of the material to be calibrated or the ensemble to be calibrated.
dcc:description dcc:textBlock	[O]	Other information not specified in the *dcc:name* or *dcc:equipmentClass* elements can be specified here.
dcc:owner dcc:contact	[O]	The element *dcc:owner* contains all necessary information to uniquely identify the owner of the calibration object(s).
dcc:item [R] dcc:item	[R]	The element *dcc:item* contains all necessary information for each individual calibration object to uniquely identify it.

dcc:calibrationLaboratory

The element type *dcc:calibrationLaboratory* contains essential information on the calibration laboratory.

Tree structure

The tree structure of the element *dcc:calibrationLaboratory* results from the element type *calibrationLaboratoryParameter*. It has the following layout:
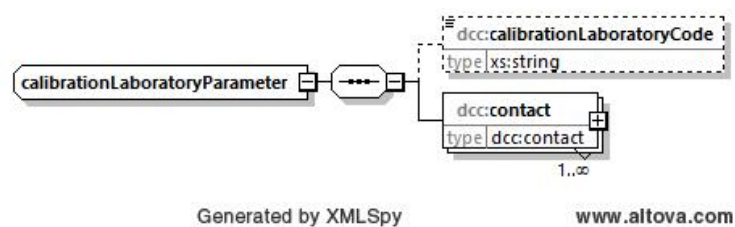
chart software

Rough structure of data type *dcc:calibrationLaboratoryParameter* of element *calibrationLaboratory*

```xml
<xs:complexType name="calibrationLaboratoryParameter">
    <xs:sequence>
        <xs:element name="calibrationLaboratoryCode" type="xs:string" minOccurs="0"/>
        <xs:element name="contact" type="dcc:contact" maxOccurs="unbounded"/>
    </xs:sequence>
</xs:complexType>
```

Completion instructions

For more information on the completion instructions, see the Elements subsection.

Minimum requirements

[R] Required	[O] Optional	[R|O] Required | Optional
This is a mandatory field.	This is an optional field.	This field may be mandatory, depending on the application.

PTB	DAkkS
PTB-specific entries are identified by the PTB logo.	DAkkS-specific entries are identified by the PTB logo.

Elements

Element		Note
dcc:calibrationLaboratoryCode xs:string	[O|R]	If the calibration laboratory has an identifier assigned to it, it must be entered here. PTB The PTB has no assigned identifier. Therefore, this element remains empty.

		DAkkS Deutsche Akkreditierungsstelle The calibration laboratories accredited by the Deutsche Akkreditierungsstelle GmbH (DAkkS) have been assigned an identifier. This must be entered here.
dcc:contact dcc:contact	[R]	The element *dcc:contact* contains all necessary information to uniquely identify the calibration laboratory.

dcc:respPersons

The element *dcc:respPersons* lists the person(s) responsible for releasing the report.

Data type: dcc:respPersonParameter

dcc:customer

The element *dcc:customer* contains essential information about the customer of the calibration laboratory.

Rough structure of data type *dcc:contact* of element *customer*

```xml
<xs:element name="customer" type="dcc:contact"/>
```

Data type: dcc:contact

Completion instructions

Further information on the completion instructions can be found in the description of the data type dcc:contact.

dcc:statements

Tree structure

The tree structure of the element *dcc:statment* results from the element type *dcc:statementParameter*. It has the following layout:
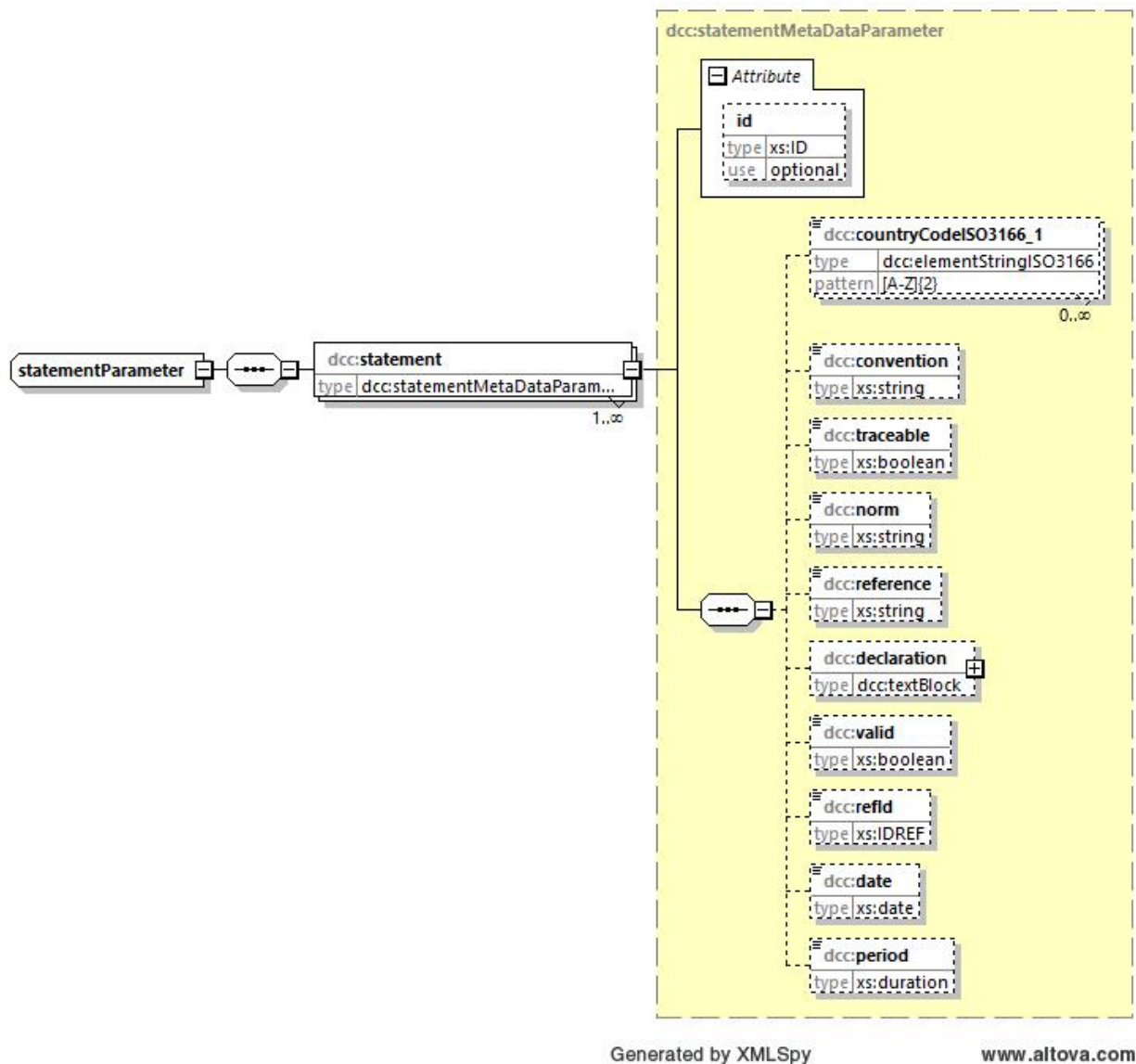
chart software

Structure in the XML Schema

```
<xs:complexType name="statementParameter">
    <xs:sequence>
        <xs:element name="statement" type="dcc:statementMetaDataParameter" maxOccurs="unbounded"/>
    </xs:sequence>
</xs:complexType>
```

dcc:textBlock

This complexType can be used to display any text. The element content contains multilingualism.

Structure in the XML Schema

```xml
<xs:complexType name="textBlock">
    <xs:sequence>
        <xs:element name="content" type="dcc:elementStringWithLang" maxOccurs="unbounded"/>
    </xs:sequence>
    <xs:attribute name="id" type="xs:ID" use="optional"/>
</xs:complexType>
```

Elements

Elements	Note
dcc:content dcc:elementStringWithLang	The element is used to enter any text. The data type implements the attribute "lang" for multilingualism.

Attributes

Attribut	Comment
xs:ID xs:ID	This standard dataType of XML is used to represent a unique ID. It is used to uniquely identify the object in the DCC. The data type xs:ID is deliberately used here, as this enables validation without any add-ons in different tools.

Examples

The examples are extracts from DCC's.

Example 1

Here is a simple example without multilingualism:

```xml
<textBlock>
    <content>Das ist ein Beispiel für das Element textBlock.</content>
</textBlock>
```

Example 2

Example 1 in the multilingual variant:

```xml
<textBlock>
    <content lang="de">Das ist ein Beispiel für das Element textBlock.</content>
    <content lang="en">This is an example of the textBlock element.</content>
</textBlock>
```

Example 3

As example 2, additionally with an ID:

```
<textBlock id="Bsp3">
    <content lang="de">Das ist ein Beispiel für das Element textBlock.</content>
    <content lang="en">This is an example of the textBlock element.</content>
</textBlock>
```

Note

The multilingualism of text entries is not controlled in this element but in the child element *content*.

dcc:elementStringISO3166

The abbreviation of a state is entered in this element. The basis is ISO 3166-1 for the assignment of two capital letters[1] to a state.

Structure in XML-Schema

```xml
<xs:simpleType name="elementStringISO3166">
    <xs:restriction base="xs:string">
        <xs:pattern value="[A-Z]{2}"/>
    </xs:restriction>
</xs:simpleType>
```

Data Type

xs:string⤢

Note

Allowed values

The element elementStringISO3166 is configured to accept exactly two uppercase letters.

---

1. https://www.iso.org/obp/ui/#search/code ↩

dcc:elementStringISO639

The abbreviation of the official language is entered in this element. The basis is ISO 639-1 for the language identifier with two lowercase letters[1].

Structure in the XML Schema

```
<xs:simpleType name="elementStringISO639">
    <xs:restriction base="xs:string">
        <xs:pattern value="[a-z]{2}"/>
    </xs:restriction>
</xs:simpleType>
```

Data type

xs:string⬈

Note

Allowed values

The element elementStringISO639 is configured to accept exactly two lowercase letters.

1. https://www.bib-bvb.de/web/kkb-online/rda-sprachencode-nach-iso-639 ↩

dcc:previousReport

The element *dcc:previousReport* contains the unique identifiers of the previous calibration certificate.

Tree structure

The tree structure of the element *dcc:previousReport* results from the element type *dcc:hash*. It has the following layout:

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Structure in the XML Schema

```xml
<xs:complexType name="hash">
    <xs:sequence>
        <xs:element name="reference" type="dcc:textBlock"/>
        <xs:element name="referenceID" type="xs:string"/>
        <xs:element name="procedure" type="xs:string"/>
        <xs:element name="value" type="xs:string"/>
        <xs:element name="linkedReport" type="dcc:hash" minOccurs="0"/>
    </xs:sequence>
    <xs:attribute name="id" type="xs:ID" use="optional"/>
</xs:complexType>
```
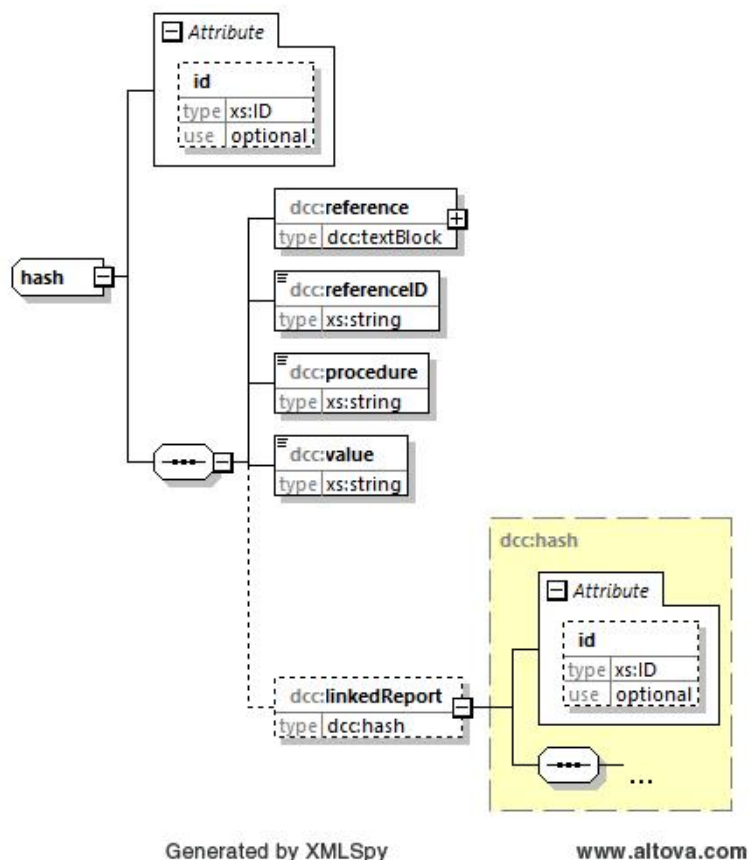
Completion instructions

For more information on the completion instructions, see the Elements subsection.

Minimum requirements

The element *dcc:previousReport* is optional. If it is filled in, it contains mandatory fields marked as follows.

[R] Required	[O] Optional	[R|O] Required | Optional
This is a mandatory field.	This is an optional field.	This field may be mandatory, depending on the application.

Elements

Element		Note
dcc:reference dcc:textBlock	[R]	Here are the details and descriptions of the previous calibration certificate, ideally already a DCC.
dcc:referenceID xs:string	[R]	The identifier (calibration certificate number) of the previous calibration certificate is entered here.
dcc:procedure xs:string	[R]	The previous calibration certificate is uniquely identified with a hash value algorithm. With the DCC, this is done automatically with the application of a digital signature. The algorithm used to calculate the hash value stored in the element *dcc:value* is named in this field.
dcc:value xs:string	[R]	The hash value is stored in this element. It was obtained by applying the hash value algorithm specified in the *dcc:procedure* element to the calibration certificate.
dcc:linkedReport dcc:linkedReport	[O]	The *dcc:linkedReport* element allows you to refer to the previous calibration certificate replaced by this DCC. A chain of calibration certificates can be specified. The structure of the element *dcc:linkedReport* is identical to that of the element *dcc:previousReport*.

Attributes

Attribut	Comment
xs:ID xs:ID	This standard dataType of XML is used to represent a unique ID. It is used to uniquely identify the object in the DCC. The data type xs:ID is deliberately used here, as this enables validation without any add-ons in different tools.

Examples

Example 1

The predecessor calibration certificate with the calibration certificate number *4914246* is a DCC. It was hashed with the Hashwertal algorithm *SHA256*. The hash value is

e14f080fcc4a8b2ut879add657d9e66f7896a.

```
<previousReport>
    <reference>
     <content>Das Vorgänger-Kalibrierzertifikat ist ein DCC.</content>
    </reference>
    <referenceID>
        <content>4914246</content>
    </referenceID>
    <procedure>SHA256</procedure>
    <value>e14f080fcc4a8b2ut879add657d9e66f7896a</value>
</previousReport>
```

Example 2

As example 1, additionally with the predecessor calibration certificate. The predecessor calibration certificate with the calibration certificate number *5678* was still analogous. It was hashed with the Hashwertal algorithm *MD5*. The hash value is *a8b4568c3ff*.

```xml
<previousReport>
    <reference>
     <content>Das Vorgänger-Kalibrierzertifikat ist ein DCC.</content>
    </reference>
    <referenceID>
        <content>4914246</content>
    </referenceID>
    <procedure>SHA256</procedure>
    <value>e14f080fcc4a8b2ut879add657d9e66f7896a</value>
    <linkedReport>
        <reference>
         <content>Das Vor-Vorgänger-Kalibrierzertifikat ist ein analoges
    Kalibrierzertifikat.        </content>
        </reference>
        <referenceID>
            <content>5678</content>
        </referenceID>
        <procedure>MD5</procedure>
        <value>a8b4568c3ff</value>
    </linkedReport>
</previousReport>
```

dcc:item

The element *dcc:item* contains all necessary information to identify and describe a single calibration object. The element with its child elements can represent a complex composition. Therefore the rough structure of the element is shown in this part of the Wiki. For a more detailed subdivision, please refer to the links.

Tree structure

The tree structure of the element *dcc:item* has the following layout:

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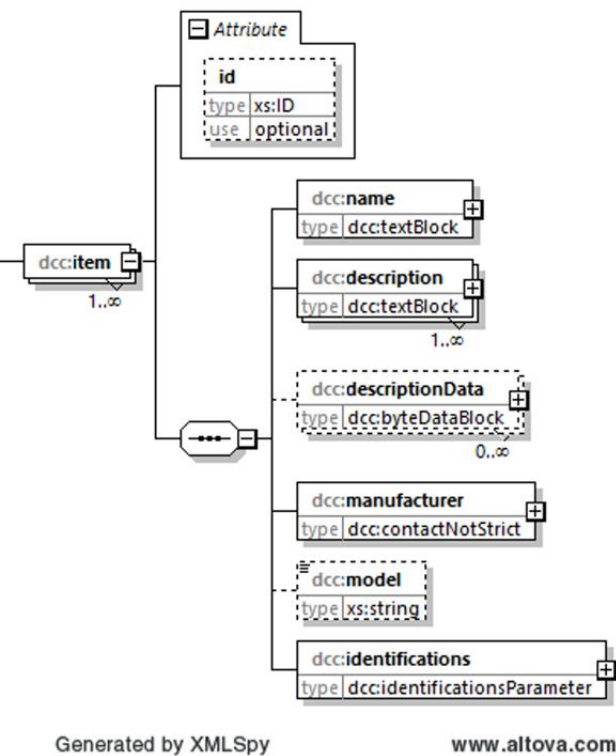
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Structure in the XML Schema

```xml
<xs:element name="item" maxOccurs="unbounded">
    <xs:complexType>
        <xs:sequence>
            <xs:element name="name" type="dcc:textBlock" />
            <xs:element name="description" type="dcc:textBlock" maxOccurs="unbounded"/>
            <xs:element name="descriptionData" type="dcc:byteDataBlock" minOccurs="0"
            maxOccurs="unbounded"/>
            <xs:element name="manufacturer" type="dcc:contactNotStrict"/>
            <xs:element name="model" type="xs:string" minOccurs="0"/>
            <xs:element name="identifications"  type="dcc:identificationsParameter" />
        </xs:sequence>
        <xs:attribute name="id" type="xs:ID" use="optional"/>
    </xs:complexType>
</xs:element>
```

Elements

Element	Note

dcc:name dcc:textBlock	[R]	This element contains the name of the item to be calibrated.
dcc:description dcc:textBlock	[R]	Other information that is not specified in the elements *dcc:name* is specified here to describe the item to be calibrated.
dcc:descriptionData dcc:byteDataBlock	[O]	Other information available as a file (for example a product description) can be entered here.
dcc:manufacturer dcc:contactNotStrict	[R]	The data of the manufacturer of the material to be calibrated are entered here. Since it is possible that the information on the manufacturer's address is no longer possible, the data type *dcc:contactNotStrict* is used here, which contains few mandatory fields.
dcc:model xs:string	[O]	Other information that does not include a statement about the model or variant of the calibration object used in the elements listed above.
dcc:identifications dcc:identifications	[R]	In addition to the contents listed above, each item to be calibrated is uniquely identified by one or more Identifier IDs. The element *dcc:identifications* is the place where this information is stored.

Attributes

Attribut	Comment
xs:ID xs:ID	This standard dataType of XML is used to represent a unique ID. It is used to uniquely identify the object in the DCC. The data type xs:ID is deliberately used here, as this enables validation without any add-ons in different tools.

dcc:contact

The element type *dcc:contact* is used to enter contact data. It is usually called from other elements.

Tree structure

The tree structure of the element type *dcc:contact* has the following layout:

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Rough structure of data type *dcc:contact*

```xml
<xs:complexType name="contact">
    <xs:sequence>
        <xs:element name="name" type="dcc:textBlock"/>
        <xs:element name="eMail" type="xs:string"/>
        <xs:element name="phone" type="xs:string" minOccurs="0"/>
        <xs:element name="fax" type="xs:string" minOccurs="0"/>
        <xs:element name="location" type="dcc:location"/>
        <xs:element name="descriptionData" type="dcc:byteDataBlock" minOccurs="0"/>
    </xs:sequence>
    <xs:attribute name="id" type="xs:ID" use="optional"/>
</xs:complexType>
```

Completion instructions

For more information on the completion instructions, see the Elements subsection.

Minimum requirements

The element *dcc:contact* is optional. If it is filled in, it contains mandatory fields marked as follows.

[R] Required	[O] Optional	[R|O] Required | Optional

This is a mandatory field.	This is an optional field.	This field may be mandatory, depending on the application.

The following applies to the registered office in Germany: In the case of legal entities, the information from the commercial register must be stated and in the case of natural persons, the primary residence; in the case of public authorities, the information from the imprint of the website must be stated.

Elements

Element		Note
dcc:name dcc:textBlock	[R]	Indication of the name of the legal or natural person.
dcc:eMail xs:string	[R]	The e-mail address of the legal or natural person.
dcc:phone xs:string	[O]	The telephone number of the legal or natural person.
dcc:fax xs:string	[O]	Indication of the fax number of the legal or natural person.
dcc:location dcc:location	[R]	The address of the legal or natural person.
dcc:descriptionData dcc:byteDataBlock	[O]	Additional information provided by the legal or natural person.

Attributes

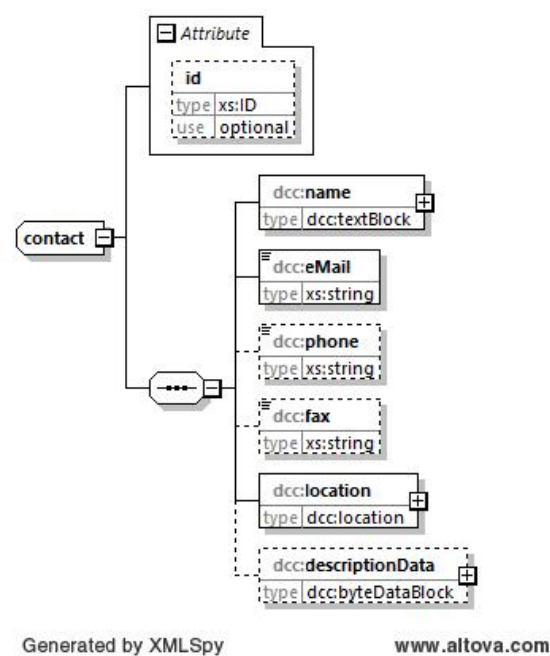| Attribut	Comment
xs:ID xs:ID	This standard dataType of XML is used to represent a unique ID. It is used to uniquely identify the object in the DCC. The data type xs:ID is deliberately used here, as this enables validation without any add-ons in different tools.

Example

Example 1

A calibration laboratory at the PTB in Braunschweig with the following (invented) address:

```
Physikalisch-Technische Bundesanstalt
z. H. Herrn Mustermann
Arbeitsgruppe 12.24 Mustermessung
Musterbau
Bundesallee 100
38116 Braunschweig
```

has the following layout in the XML file:

```
<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>
```

```xml
                    <dcc:further>
                        <dcc:content>z. H. Herrn Mustermann</dcc:content>
                        <dcc:content>Arbeitsgruppe 12.24 Mustermessung</dcc:content>
                        <dcc:content>Musterbau</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:respPersonParameter

The element type *dcc:respPersonParameter* is required for the person responsible for releasing the report.

Tree structure

The tree structure of the element *dcc:respPerson* results from the element type *dcc:respPersonParameter*. It has the following layout:

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Rough structure of element type *dcc:respPersonParameter* of element *respPersons*

```xml
<xs:complexType name="respPersonParameter">
    <xs:sequence>
        <xs:element name="respPerson" maxOccurs="unbounded">
            <xs:complexType>
                <xs:sequence>
                    <xs:element name="person" type="dcc:contactNotStrict"/>
                    <xs:element name="description" type="dcc:textBlock" minOccurs="0"/>
                    <xs:element name="mainSigner" type="xs:boolean" minOccurs="0"/>
                    <xs:element name="cryptElectronicSeal" type="xs:boolean" minOccurs="0"/>
                    <xs:element name="cryptElectronicSignature" type="xs:boolean" minOccurs="0"/>
                    <xs:element name="cryptElectronicTimeStamp" type="xs:boolean" minOccurs="0"/>
                </xs:sequence>
                <xs:attribute name="id" type="xs:ID" use="optional"/>
            </xs:complexType>
        </xs:element>
    </xs:sequence>
</xs:complexType>
```
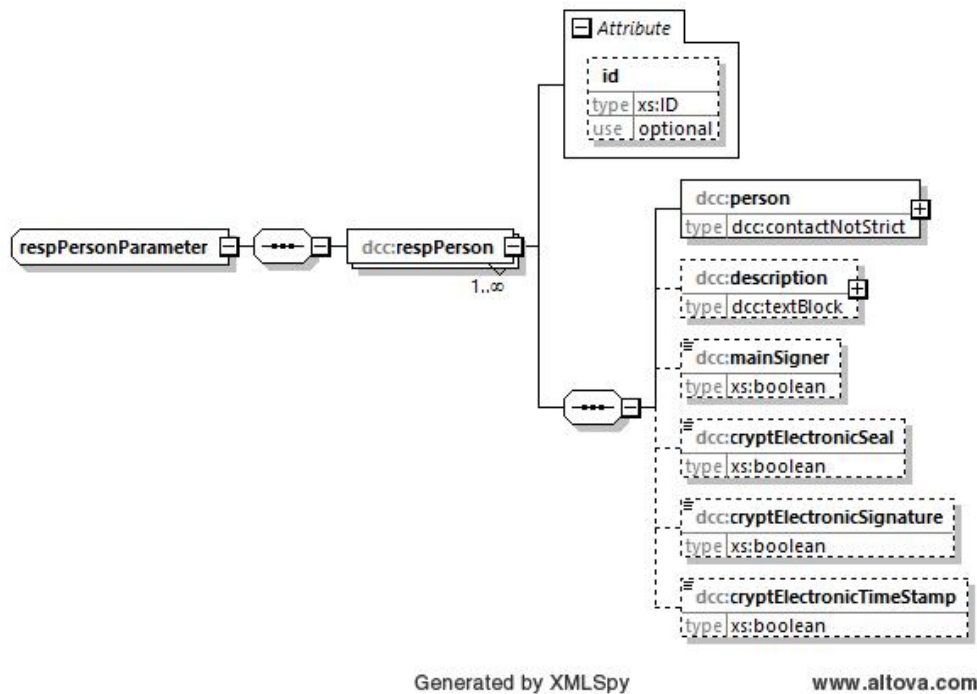
Completion instructions

For more information on the completion instructions, see the Elements subsection.

Minimum requirements

[R] Required	[O] Optional	[R|O] Required | Optional
This is a mandatory field.	This is an optional field.	This field may be mandatory, depending on the application.

Elements

Element		Note
dcc:person dcc:contactNotStrict	[R]	Name of the person and their contact details.
dcc:description dcc:textBlock	[O]	Further description of the person, as far as it could not take place in the element *person*.
dcc:mainSigner xs:boolean	[R|O]	One person is to assume overall responsibility for the DCC. Therefore, the value for the child element *mainSigner* should have the value "TRUE" for exactly one element of *respPerson*.
dcc:cryptElectronicSeal xs:boolean	[O]	Is the person responsible for affixing the cryptographic electronic seal? In this case, the ELement *cryptElectronicSeal* should have the value "TRUE".
dcc:cryptElectronicSignature xs:boolean	[O]	Is the person responsible for affixing the cryptographic electronic signature? In this case, the element *cryptElectronicSignature* should have the value "TRUE".
dcc:cryptElectronicTimeStamp xs:boolean	[O]	Is the person responsible for affixing the cryptographic electronic timestamp? In this case, the ELement *cryptElectronicTimeStamp* should have the value "TRUE".

Attributes

Attribut	Comment
xs:ID xs:ID	This standard dataType of XML is used to represent a unique ID. It is used to uniquely identify the object in the DCC. The data type xs:ID is deliberately used here, as this enables validation without any add-ons in different tools.

dcc:elementStringWithLang

This element type is used to display text. The attribute "long" indicates the official language used in this text, see below.

Structure in the XML Schema

```xml
<xs:complexType name="elementStringWithLang">
    <xs:simpleContent>
        <xs:extension base="xs:string">
            <xs:attribute name="lang" type="dcc:elementStringISO639" use="optional"/>
            <xs:attribute name="id" type="xs:ID" use="optional"/>
        </xs:extension>
    </xs:simpleContent>
</xs:complexType>
```

Data type

xs:string

dcc:elementStringISO639

Attributes

Attribut	Comment
xs:ID xs:ID	This standard dataType of XML is used to represent a unique ID. It is used to uniquely identify the object in the DCC. The data type xs:ID is deliberately used here, as this enables validation without any add-ons in different tools.
dcc:lang	This attribute determines the official language that is stored in the element *elementStringWithLang*. The possible languages are controlled by the element *dcc:elementStringISO0639*.

dcc:linkedReport

The element *dcc:linkedReport* contains the unique identifiers of a recursive chain of previous calibration certificates. It can be called recursively any number of times.

Tree structure

The tree structure of the element *dcc:linkedReport* results from the element type *dcc:hash*. It has the following layout:

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Struktur im XML-Schema

```
<xs:complexType name="hash">
    <xs:sequence>
        <xs:element name="reference" type="dcc:textBlock"/>
        <xs:element name="referenceID" type="xs:string"/>
        <xs:element name="procedure" type="xs:string"/>
        <xs:element name="value" type="xs:string"/>
        <xs:element name="linkedReport" type="dcc:hash" minOccurs="0"/>
    </xs:sequence>
    <xs:attribute name="id" type="xs:ID" use="optional"/>
</xs:complexType>
```
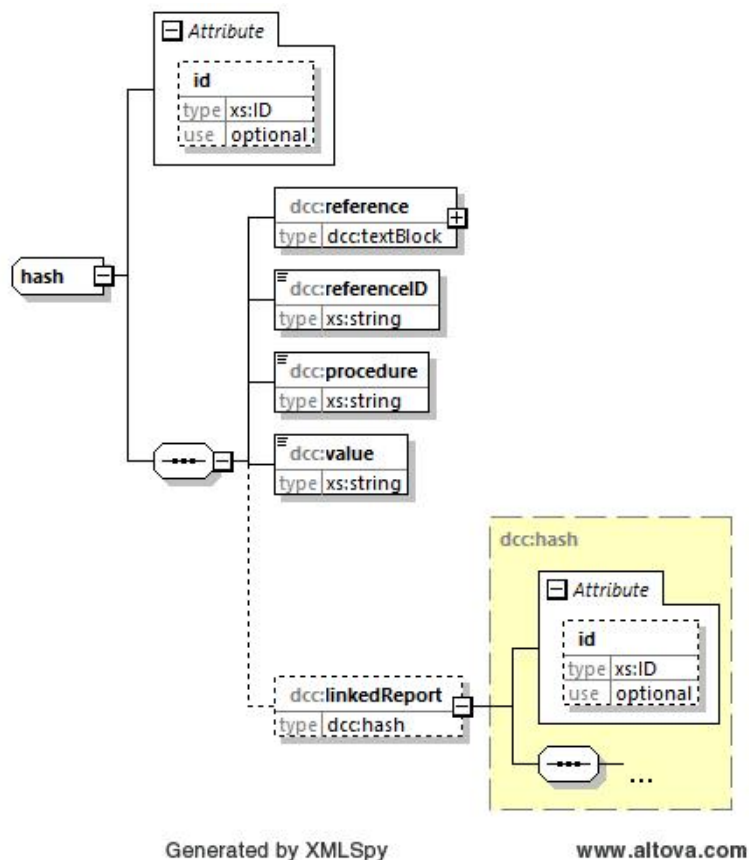
Completion instructions

For more information on the completion instructions, see the Elements subsection.

Minimum requirements

The element *dcc:hash* is optional. If it is filled in, it contains mandatory fields marked as follows.

[R] Required	[O] Optional	[R|O] Required | Optional
This is a mandatory field.	This is an optional field.	This field may be mandatory, depending on the application.

Elements

Element		Note
dcc:reference dcc:textBlock	[R]	Here are the details and descriptions of the previous calibration certificate, ideally already a DCC.
dcc:referenceID xs:string	[R]	The identifier (calibration certificate number) of the previous calibration certificate is entered here.
dcc:procedure xs:string	[R]	The predecessor calibration certificate is uniquely identified with a hash value algorithm. With the DCC, this is done automatically with the application of a digital signature. The algorithm used to calculate the hash value stored in the element *dcc:value* is named in this field.
dcc:value xs:string	[R]	The hash value is stored in this element. It was obtained by applying the hash value algorithm specified in the *dcc:procedure* element to the calibration certificate.
dcc:linkedReport dcc:linkedReport	[O]	The *dcc:linkedReport* element allows you to refer to the previous calibration certificate replaced by this DCC. A chain of calibration certificates can be specified. The structure of the *dcc:linkedReport* element is identical to that of the *dcc:previousReport* element.

Attributes

Attribut	Comment
xs:ID xs:ID	This standard dataType of XML is used to represent a unique ID. It is used to uniquely identify the object in the DCC. The data type xs:ID is deliberately used here, as this enables validation without any add-ons in different tools.

Examples

Example 1

The predecessor calibration certificate with the calibration certificate number *4914246* is a DCC. It was hashed with the Hashwertal algorithm *SHA256*. The hash value is

e14f080fcc4a8b2ut879add657d9e66f7896a.

```
<previousReport>
    <reference>
     <content>Das Vorgänger-Kalibrierzertifikat ist ein DCC.</content>
    </reference>
    <referenceID>
        <content>4914246</content>
    </referenceID>
    <procedure>SHA256</procedure>
    <value>e14f080fcc4a8b2ut879add657d9e66f7896a</value>
</previousReport>
```

Example 2

As example 1, additionally with the predecessor calibration certificate. The predecessor calibration certificate with the calibration certificate number *5678* was still analogous. It was hashed with the Hashwertal algorithm *MD5*. The hash value is *a8b4568c3ff*.

```xml
<previousReport>
    <reference>
     <content>Das Vorgänger-Kalibrierzertifikat ist ein DCC.</content>
    </reference>
    <referenceID>
        <content>4914246</content>
    </referenceID>
    <procedure>SHA256</procedure>
    <value>e14f080fcc4a8b2ut879add657d9e66f7896a</value>
    <linkedReport>
        <reference>
         <content>Das Vor-Vorgänger-Kalibrierzertifikat ist ein analoges
    Kalibrierzertifikat.       </content>
        </reference>
        <referenceID>
            <content>5678</content>
        </referenceID>
        <procedure>MD5</procedure>
        <value>a8b4568c3ff</value>
    </linkedReport>
</previousReport>
```

dcc:byteDataBlock

The element type *dcc:byteDataBlock* is used to enter any information available as electronic data.

Tree structure

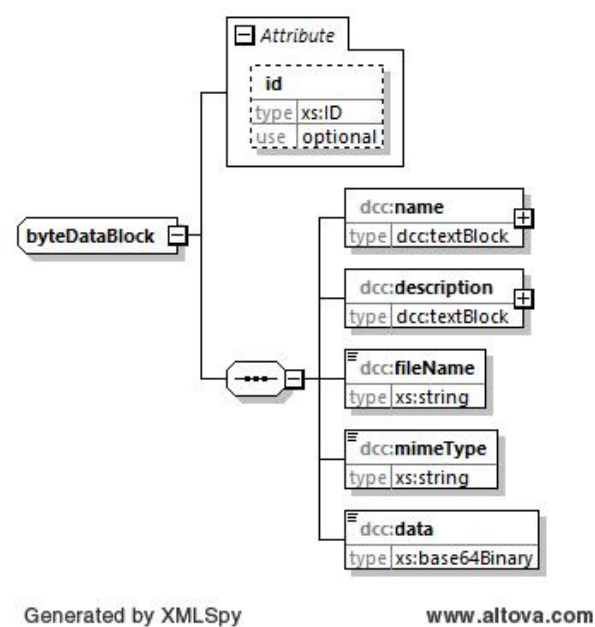The tree structure of the element type *dcc:byteDataBlock* has the following layout:

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Rough structure of element type *dcc:byteDataBlock*

```xml
<xs:complexType name="byteDataBlock">
    <xs:sequence>
        <xs:element name="name" type="dcc:textBlock"/>
        <xs:element name="description" type="dcc:textBlock"/>
        <xs:element name="fileName" type="xs:string"/>
        <xs:element name="mimeType" type="xs:string"/>
        <xs:element name="data" type="xs:base64Binary"/>
    </xs:sequence>
    <xs:attribute name="id" type="xs:ID" use="optional"/><!--92200_A_I-->
</xs:complexType>
```

Completion instructions

For more information on the completion instructions, see the Elements subsection.

Minimum requirements

The element *dcc:byteDataBlock* is optional. If it is filled in, it contains mandatory fields marked as follows.

[R] Required	[O] Optional	[R|O] Required | Optional
This is a mandatory field.	This is an optional field.	This field may be mandatory, depending on the application.

Elements

Element		Note
dcc:name dcc:textBlock	[R]	Specifies the topic of the file that is attached.
dcc:description dcc:textBlock	[R]	Specifies the contents of the attached file.
dcc:fileName xs:string ↗	[R]	Name of the attached file.
dcc:mimeType xs:string ↗	[R]	Specifies the MIME type of the attached file.
dcc:data xs:base64Binary ↗	[R]	The data is stored in this element after it has been coded using the Base64 [1] method.

Note:

The byteDataBlock defines a type that allows to add binary coded files. It is a good practice to use the Base64 Data Encodings standard, RFC 4648 [1:1].

Examples for the content are image files or ZIP archives. The fileName element specifies the name of the original file. The element mimeType is the underlying file type (e.g. zip, jpeg, png). Element data contains the base64Binary encoded file.

Attributes

Attribut	Comment
xs:ID xs:ID ↗	This standard dataType of XML is used to represent a unique ID. It is used to uniquely identify the object in the DCC. The data type xs:ID is deliberately used here, as this enables validation without any add-ons in different tools.

1. Base64 Data Encodings standard, siehe RFC 4648: https://tools.ietf.org/html/rfc4648 ↩ ↩

dcc:contactNotStrict

The element type *dcc:contactNotStrict* is used to enter contact data. It is usually called from other elements.

Tree structure

The tree structure of the element type *dcc:contactNotStrict* has the following layout:
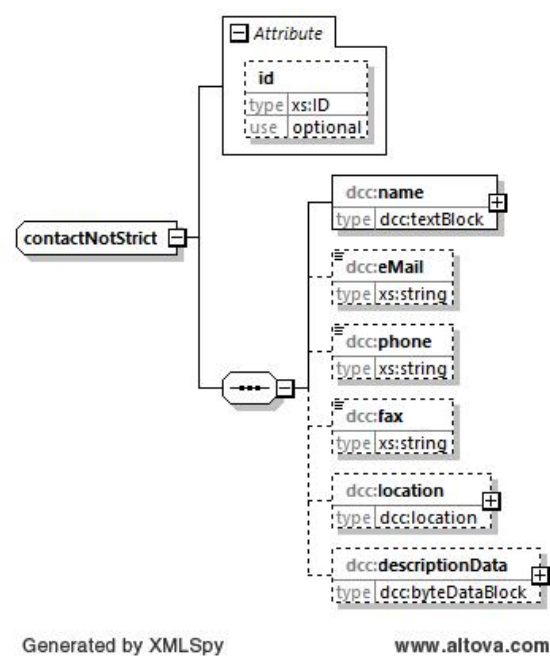

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Rough structure of element type *dcc:contactNotStrict*

```xml
<xs:complexType name="contactNotStrict">
    <xs:sequence>
        <xs:element name="name" type="dcc:textBlock"/>
        <xs:element name="eMail" type="xs:string" minOccurs="0"/>
        <xs:element name="phone" type="xs:string" minOccurs="0"/>
        <xs:element name="fax" type="xs:string" minOccurs="0"/>
        <xs:element name="location" type="dcc:location" minOccurs="0"/>
        <xs:element name="descriptionData" type="dcc:byteDataBlock" minOccurs="0"/>
    </xs:sequence>
    <xs:attribute name="id" type="xs:ID" use="optional"/>
</xs:complexType>
```

Completion instructions

For more information on the completion instructions, see the Elements subsection.

Minimum requirements

The element *dcc:contactNotStrict* is optional. If it is filled in, it contains mandatory fields marked as follows.

[R] Required	[O] Optional	[R|O] Required | Optional

| This is a mandatory field. | This is an optional field. | This field may be mandatory, depending on the application. |

The following applies to the registered office in Germany: In the case of legal entities, the information from the commercial register must be stated and in the case of natural persons, the primary residence; in the case of public authorities, the information from the imprint of the website must be stated.

Elements

Element		Note
dcc:name dcc:textBlock	[R]	Indication of the name of the legal or natural person.
dcc:eMail xs:string	[O]	The e-mail address of the legal or natural person.
dcc:phone xs:string	[O]	The telephone number of the legal or natural person.
dcc:fax xs:string	[O]	Indication of the fax number of the legal or natural person.
dcc:location dcc:location	[O]	The address of the legal or natural person.
dcc:descriptionData dcc:byteDataBlock	[O]	Additional information provided by the legal or natural person.

Attributes

Attribut	Comment
xs:ID xs:ID	This standard dataType of XML is used to represent a unique ID. It is used to uniquely identify the object in the DCC. The data type xs:ID is deliberately used here, as this enables validation without any add-ons in different tools.

dcc:identifications

In addition to the contents listed above, each item to be calibrated is uniquely identified in the elements by one or more identifiers. The element *dcc:identifications* is the place where this information is stored.

Note

In very rare cases it may happen that no identifiers are present on the material to be calibrated. Therefore the input is not mandatory. It is recommended that the calibration laboratory remedies this deficiency.

Tree structure

The tree structure of the element *dcc:identifications* results from the element type *dcc:identificationsParameter*. It has the following layout:
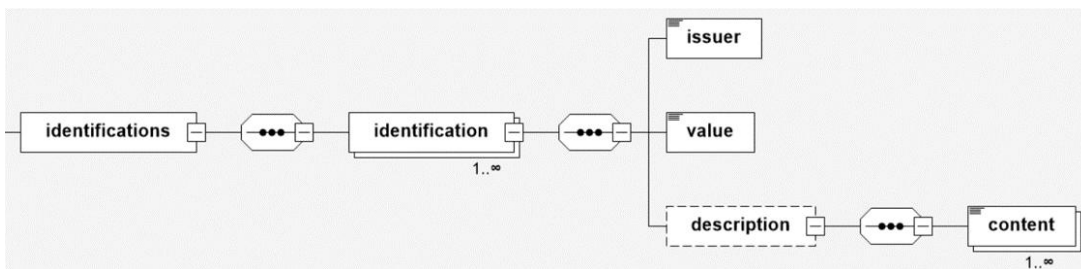

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Struktur im XML-Schema

```xml
<xs:element name="identificationsParameter" minOccurs="0">
    <xs:complexType>
        <xs:sequence>
            <xs:element name="identification" maxOccurs="unbounded">
                <xs:complexType>
                    <xs:sequence>
                        <xs:element name="issuer">
                            <xs:simpleType>
                                <xs:restriction base="xs:string">
                                    <xs:enumeration value="manufacturer"/>
                                    <xs:enumeration value="calibrationLaboratory"/>
                                    <xs:enumeration value="customer"/>
                                    <xs:enumeration value="owner"/>
                                    <xs:enumeration value="other"/>
                                </xs:restriction>
                            </xs:simpleType>
                        </xs:element>
                        <xs:element name="value" type="xs:string"/>
                        <xs:element name="description" type="dcc:textBlock" minOccurs="0"/>
                    </xs:sequence>
                    <xs:attribute name="id" type="xs:ID" use="optional"/>
                </xs:complexType>
            </xs:element>
        </xs:sequence>
    </xs:complexType>
</xs:element>
```

Completion instructions

For more information on the completion instructions, see the Elements subsection.

Minimum requirements

[R] Required	[O] Optional	[R|O] Required | Optional
This is a mandatory field.	This is an optional field.	This field may be mandatory, depending on the application.

Elements

Element		Note
dcc:identifications	[R]	The element is the root element for entering the identifiers. It contains the child element *identification*, in which the respective identifier is to be entered.
dcc:identification	[R]	At least one element of *dcc:identification* must be completed.
dcc:issuer	[R]	Only one of the following words can be entered in the *issuer* element. - manufacturer - calibrationLaboratory - customer - owner - other If the element is filled with a different content, an error occurs during the check against the XML schema.
dcc:value xs:string⬀	[R]	The identifier is entered here.
dcc:description dcc:textBlock	[O]	Other information about the identifier.

Examples

Example 1

The manufacturer has indicated the identification number 1040917:

```
<dcc:identifications>
    <dcc:identification>
        <dcc:issuer>manufacturer</dcc:issuer>
        <dcc:value>1040917</dcc:value>
    </dcc:identification>
</dcc:identifications>
```

Example 2

The manufacturer has indicated the identification number 1040917, the batch A3/19 and has also clearly distinguished between the identification number and the batch:

```
<dcc:identifications>
    <dcc:identification>
        <dcc:issuer>manufacturer</dcc:issuer>
        <dcc:value>1040917</dcc:value>
```

```
    </dcc:identification>
        <dcc:description>
            <dcc:content lang="de">Kennnummer</dcc:content>
            <dcc:content lang="en">Serial No.</dcc:content>
        </dcc:description>
    <dcc:identification>
        <dcc:issuer>manufacturer</dcc:issuer>
        <dcc:value>A3/19</dcc:value>
    </dcc:identification>
        <dcc:description>
            <dcc:content lang="de">Charge</dcc:content>
            <dcc:content lang="en">Charge</dcc:content>
        </dcc:description>
</dcc:identifications>
```

Example 3

The manufacturer, calibration laboratory and customer have each indicated an identification number:

```
<dcc:identifications>
    <dcc:identification>
        <dcc:issuer>manufacturer</dcc:issuer>
        <dcc:value>1040917</dcc:value>
        <dcc:description>
            <dcc:content lang="de">Kennnummer</dcc:content>
            <dcc:content lang="en">Serial No.</dcc:content>
        </dcc:description>
    </dcc:identification>
    <dcc:identification>
        <dcc:issuer>calibrationLaboratory</dcc:issuer>
        <dcc:value>PTB4711</dcc:value>
        <dcc:description>
            <dcc:content lang="de">Kennnummer</dcc:content>
            <dcc:content lang="en">Serial No.</dcc:content>
        </dcc:description>
    </dcc:identification>
    <dcc:identification>
        <dcc:issuer>customer</dcc:issuer>
        <dcc:value>0815</dcc:value>
        <dcc:descriptio>
            <dcc:content lang="de">Kennnummer</dcc:content>
            <dcc:content lang="en">Serial No.</dcc:content>
        </dcc:description>
    </dcc:identification>
</dcc:identifications>
```

location

The element type *dcc:location* is used to enter the address.

Tree structure

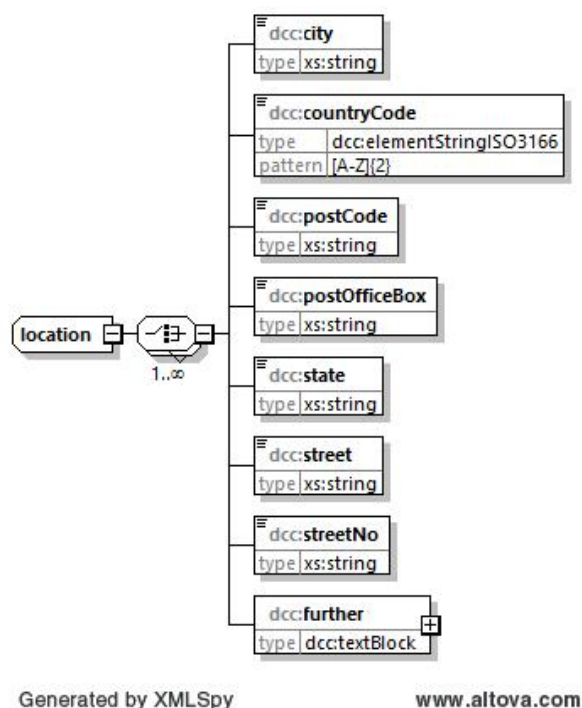The tree structure of the element type *dcc:location* has the following layout:

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Rough structure of element type *dcc:location*

```xml
<xs:complexType name="location">
    <xs:choice maxOccurs="unbounded">
        <xs:element name="city" type="xs:string"/>
        <xs:element name="countryCode" type="dcc:elementStringISO3166"/>
        <xs:element name="postCode" type="xs:string"/>
        <xs:element name="postOfficeBox" type="xs:string"/>
        <xs:element name="state" type="xs:string"/>
        <xs:element name="street" type="xs:string"/>
        <xs:element name="streetNo" type="xs:string"/>
        <xs:element name="further" type="dcc:textBlock"/>
    </xs:choice>
</xs:complexType>
```

Completion instructions

For more information on the completion instructions, see the Elements subsection.

Minimum requirements

The element *dcc:location* is optional. If it is filled in, it contains mandatory fields marked as follows.

[R] Required	[O] Optional	[R|O] Required | Optional
This is a mandatory field.	This is an optional field.	This field may be mandatory, depending on the application.

Note

The child elements of the element *location* can be entered any number of times in any sequence. The motivation for this lies in the different ways in which addresses are specified in the states.

The check for logical correctness cannot be performed by the XML schema.

Elements

Element		Note
city xs:string	[O|R]	The name of the town.
countryCode dcc:elementStringISO3166	[O|R]	The country code, consisting of two capital letters.
postCode xs:string	[O|R]	The postal code.
postOfficeBox xs:string	[O|R]	The mailbox.
state xs:string	[O|R]	The federal state.
street xs:string	[O|R]	The street name.
streetNo xs:string	[O|R]	The house number.
further dcc:textBlock	[O|R]	Indication of additional information useful for an exact postal address.