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Smart CE marking for construction products

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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European foreword

CWA Smart CE marking for construction products was developed in accordance with CEN-CENELEC Guide 29 “CEN/CENELEC Workshop Agreements – The way to rapid agreement” and with the relevant provisions of CEN/CENELEC Internal Regulations - Part 2. It was agreed on 2018-05-07 in a Workshop by representatives of interested parties, approved and supported by CEN following a public call for participation made on 2017-11-08. It does not necessarily reflect the views of all stakeholders that might have an interest in its subject matter.

The final text of CWA Smart CE marking was submitted to CEN for publication on 2018-06-07. It was developed and approved by:

— Construction Products Europe

— AENOR

— ArcelorMittal Flat Carbon Europe SA

— coBuilder International

— ECAP – European Consortium of Anchors Producers

— ECSPA – European Calcium Silicate Producers Association

— EFCC - European Federation for Construction Chemicals

— EMO – European Mortar Industry Organisation

— Eurogypsum AISBL

— FEICA – Association of the European Adhesive and Sealant Industry

— FIEC – European Construction Industry Frederation

— Ideal Standard International

— NVTB Bouwmaterialen – Dutch construction products

— ProductIP B.V.

— PU Europe

— SBS – Small Business Standards

— Wienerberger AG

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Introduction

Construction Products Europe AISBL represents the interests of all European construction products manufacturers, from SMEs to multinational companies. It was established in 1988 as an AISBL, a non-profit making organisation under Belgian law.

Construction Products Europe identified during the drafting process of Regulation (EU) No 305/2011 [1], usually called Construction Products Regulation or CPR, the need to make the Declaration of Performance (DoP) requested by the regulation available online.

The European Commission published some years later the Commission Delegated Regulation (EU) No 157/2014 [2] allowing manufacturers to make available the declaration of performance of their products on websites. The explanatory memorandum of the document included a reference to machine readable formats:

"When declarations of performance are made available on an Internet site, due care is to be exercised when ensuring its appropriate upkeep and maintenance, so as to avoid as far as possible its unavailability owing to malfunctioning of the information technology systems in place. The information is to be displayed preferably using semantic web technologies making sure that it is displayed in a human readable format, like HTML, and a machine readable format, like XML. The schema for the machine readable format should preferably use standard or widely used data schemas, so that the information is interoperable with most architectural tools."

Manufacturers widely benefited from this option but the most commonly format used was pdf. This situation reduced the usability of the content of the declaration of performance.

Construction Products Europe discussed during the last years the development of a harmonised XML format to deliver declarations of performance. The goal is the implementation of the proposal already suggested in the Commission Delegated Regulation. This action was tested in a proof of concept for six harmonised standards. The outcome was very positive and received the support of construction products manufacturers, contractors, authorities and other stakeholders in the construction chain. The research covered extensive discussions with CEN/TC 442 experts dealing with Support Data Dictionaries.

This document contains guidance on how harmonised XML formats may be developed as part of the harmonised product standards related to the CPR. Availability of these formats together with the information already available in the standards will allow manufacturers to easily deliver the requested and compulsory information in a way easily managed both by humans and machines. The action will also push the development of electronic tools (mainly BIM tools) and will facilitate the use of current CE label and DoP in a "smart way" by creating the digital connection between the construction product and the regulatory information related to it.

Making a DoP available on a website according to the Smart CE marking XML formats for each specific standard, when available, is an option for manufacturers. Benefits from this approach will not change any legal obligations from the CPR (e.g. availability of the document for at least 10 years).

1 Scope

Smart CE marking for construction products aims to digitalise mandatory construction products information provided in the declaration of performance (DoP) according to Regulation (EU) No 305/2011 [1]. When available for their standards, manufacturers will have the option to make their DoP available in their websites in XML format (human and machine readable), the files will be accessible through the link included in the CE marking. This link will allow the use of "smart" devices connected to internet (mobile phones, tablets, computers, etc) to use this information through internet browsers, applications or software.

Harmonisation will be achieved through the development of XML formats for each harmonised product standard. This document provides guidance on how these formats should be developed to properly establish a consistent digital information environment.

CEN/TC 442 work was used as input for the development of this document. CEN/TC 442 Product Data Templates will cover a wider scope than Smart CE marking for construction products. The structure of Smart CE marking formats forms a part of Product Data Templates.

2 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

2.1
AVCP
Assessment and Verification of Constancy of Performance of construction products in relation to their essential characteristics is carried out in accordance with Commission Delegated Regulation (EU) No 568/2014 [4].

[SOURCE: Regulation (EU) No 305/2011 [1], article 28(1)]

2.2
class
a range of levels, delimited by a minimum and a maximum value, of performance of a construction product.

[SOURCE: Regulation (EU) No 305/2011 [1], article 2(7)]

2.3
Declaration of Performance
DoP
The declaration of performance shall express the performance of construction products in relation to the essential characteristics of those products in accordance with the relevant harmonised technical specifications.

[SOURCE: Regulation (EU) No 305/2011 [1], article 6(1) and Delegated Regulation (EU) 574/2014]

2.4
element
Content between the opening and the closing tag, including them. They are complex if contain other elements and simple if not.

2.5
Globally Unique Identifier
GUID
128-bit integer number used to identify resources.

2.6
harmonised product standard
Standard developed by mandate of the European Commission as harmonised technical specification for a family of products according to Regulation (EU) No 305/2011 [1]. It contains guidance for the development of declarations of performance for a certain family or families of products.

2.7
manufacturer
any natural or legal person who manufactures a construction product or who has such a product designed or manufactured, and markets that product under his name or trademark.

[SOURCE: Regulation (EU) No 305/2011 [1], article 2(19)]

2.8
level
the result of the assessment of the performance of a construction product in relation to its essential characteristics, expressed as a numerical value.

[SOURCE: Regulation (EU) No 305/2011 [1], article 2(6)]

2.9
Notified Body
NB
Third-party body established under national law with legal personality, independent from the organisation it assesses able to perform the tasks described in Commission Delegated Regulation (EU) No 568/2014 [4] .

[SOURCE: Elaborated from Regulation (EU) No 305/2011 [1], article 43]

2.10
performance of a construction product
the performance related to the relevant essential characteristics, expressed by level or class, or in a description.

[SOURCE: Regulation (EU) No 305/2011 [1], article 2(5)]

2.11
tag
The way to structure information in XML format. It is identified by the initial character "<" and the final character ">".

2.12
Unified Modelling Language
UML
Language to provide system architects, software engineers, and software developers with tools for analysis, design, and implementation of software-based systems as well as for modelling business and similar processes.

[SOURCE: ISO/IEC 19505-1:2012 [5], scope]

2.13
XML
Extensible Markup Language.

2.14
XML document
XML file containing the specific information inserted by the manufacturer for a specific product type.

2.15
XML format
XML file containing the generic structure compliant with Regulation (EU) No 305/2011 [1] and the specific harmonised product standard.

2.16
XSD
XML Schema Definition. Formal description of XML elements in an XML document.

2.17
XSD file
XSD file containing additional restrictions to the structure of an XML format.

2.18
XSLT
Extensible Stylesheet Language Transformations. Language to transform XML documents into other formats such as HTML (websites) or, with additional conversions, into PDF.

3 XML formats and information exchange

3.1 Introduction

Extensible Markup Language or XML is a method to describe a document by using tags. The main difference from other languages is the lack of functions, loops or logic. It is extensible because it allows the creation of markup languages based on it. In fact, Smart CE marking is a specific markup language to exchange the information available in declarations of performance developed according to Regulation (EU) No 305/2011 [1] and the relevant harmonised product standard.

Information in declarations of performance is complex and difficult to manage by software but XML formats offer the possibility to develop complex structures. As XML is an open standard the information will be accessible to humans, in fact internet browsers and text processor software are able to show XML documents. Machines will also be able to obtain the relevant information because they will identify them using the tags. However, this is only possible if the language is properly developed and the delivery and the collection of information is done using the right data dictionary.

3.2 XML parts

An XML contains the following parts.

3.2.1 XML prolog

The first line of the XML format is the prolog. It is the first line of the document and includes the xml version used, usually 1.0, and the encoding used. UTF-8 is the default encoding for XML documents.

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

3.2.2 Tags

The tags define the elements in the format. There are two types of tags, the opening tag and the closing tag. The opening tag contains the name of the tag between "<" and ">".

EXAMPLE 1 <Name>

The closing tag is the same but adding a slash character before the name, "</" and ">"

EXAMPLE 2 </Name>

The opening tag may contain attributes to define additional characteristics

There are some rules to follow when using tags:

— Every opening tag shall have a closing tag;

— Tags are case sensitive;

— Elements shall be properly nested, meaning that when a tag is opened inside an element, it shall be closed inside this element;

— Attributes in the tags shall be quoted.

The Smart CE marking XML format will use tags in English. The reason is because it is the usual working language in standardisation bodies and European institutions.

Clause 7 contains the list of tags used in Smart CE XML formats.

3.2.3 Elements

The elements defined by the tags are the core of the format. The element containing all the other elements of the format is called root. When an element, A, is included in another element, B, A is called "child" element of B and B is called "parent" element of A. This way to associate elements is called nesting.

The Smart CE marking XML format will use elements in English. The reason is because it is the usual working language in standardisation bodies and European institutions. The definition and introduction of GUIDs will make all the content language independent.

NOTE The obligation by Regulation (EU) No 305/2011 [1] to supply the declaration of performance in the language or languages required by the Member State where the product is made available may force manufacturers to develop specific tools to translate the part of the content that is language dependant such as intended use/s, descriptions, etc.

Other documents will be developed to address this important issue.

3.2.4 Comments

The comments in XML format are introduced between "<!--" and -->. The content of the comment is not considered by software when reading the XML format.

EXAMPLE <!-- This is a comment -->

3.2.5 Special symbols

The following special symbols are defined to allow the introduction of characters used in XML to define elements:

— & ampersand &

— < less than <

— > greater than >

— ' apostrophe '

— " quotation mark "

3.3 Development of XML formats and documents

For the purposes of this document XML format and XML documents shall be differentiated:

3.3.1 XML format

Smart CE marking XML format, or XML format is the XML structure developed according to Regulation (EU) No 305/2011 [1] and a specific dated harmonised product standard. The structure is valid for all the products falling under the scope of the harmonised product standard but it does not contain information from specific products it is just a template to be filled by manufacturers.

XML formats are developed in close collaboration with the relevant product CEN/TC to ensure that the content is consistent with the harmonised product standard. Compliance with Regulation (EU) No 305/2011 [1] is also checked when developing XML formats.

There is only one valid XML format for every dated harmonised product standard

3.3.2 XML document

The XML document is a document following the XML format structure and filled with the full DoP information for a specific product type. Manufacturers can develop an XML document for each product type according to the relevant XML format. The link between the product type and the format to be used is the dated reference to the relevant harmonised standard as cited in the Official Journal of the European Union.

4 XSD – XML Schema Definition

4.1 Introduction

The content of Smart CE XML formats and documents may be validated using XML Schema definitions or XSD document. XML documents following the syntax rules of XML can contain mistakes because additional restrictions may apply, the usual verifications an XSD can do are:

— Elements and attributes that are allowed;

— Number and order of child elements;

— Data types for elements attributes;

— Allowed values for elements and attributes.

EXAMPLE In a declaration of performance the *unique identification code of the product-type* is a single element. XML format do not restrict the number of elements but XSD may contain this restriction.

4.2 Development of XSD file

The XSD file is an additional file developed together with the XML format. It contains additional restrictions according to the relevant harmonised product standards and Regulation (EU) No 305/2011 [1]. XDS files are optional but provide additional content verification to XML document developers and facilitate the coding of software tools to deal with XML documents' information.

The core of this document is the design of XML formats for smart CE marking but the development of XSD files for each XML format would facilitate the validation of XML documents. In practice the first step to use the information in a XML format is through XSD files, if they are available, manufacturers drawing up their DoP according to the XML format and software developers will benefit from an initial validation check for the documents.

5 XSLT language

Information available in XML documents may be easily transformed into other formats by using XSLT languages. The main utility of this option is the automatic conversion of XML documents into HTML code that can be displayed by internet browsers in the same way websites are shown. The same applies to the transformation of the XML document into a PDF document.

This document will not address XML document conversion but recommends further analysis of the available tools to benefit from the advantages of format conversion.

6 Smart CE structure

6.1 Legal restrictions

Smart CE marking XML formats follow the structure defined by Commission Delegated Regulation (EU) No 574/2014 [3], which replaces the original Annex III of Regulation (EU) No 305/2011 [1]. Declarations of performance shall follow the model set out in revised Annex III to be considered compliant with the regulation so the content of the XML format also follows the model.

Smart CE XML formats benefit from some of the flexibility options offered by the Annex III of the regulation but will keep certain rules to guarantee consistency and facilitate software development:

— Numbers shall not be included in the tags or in the elements;

— Elements shall follow the fixed order defined in clause 6.6;

— Empty elements, when allowed, shall not be deleted but included as empty;

— The use of No Performance Determined (NPD) shall respect the regulatory provisions of the CPR.

6.2 UML structure

Figure 1 — Smart CE marking UML diagramshows the common structure of Smart CE marking XML formats.

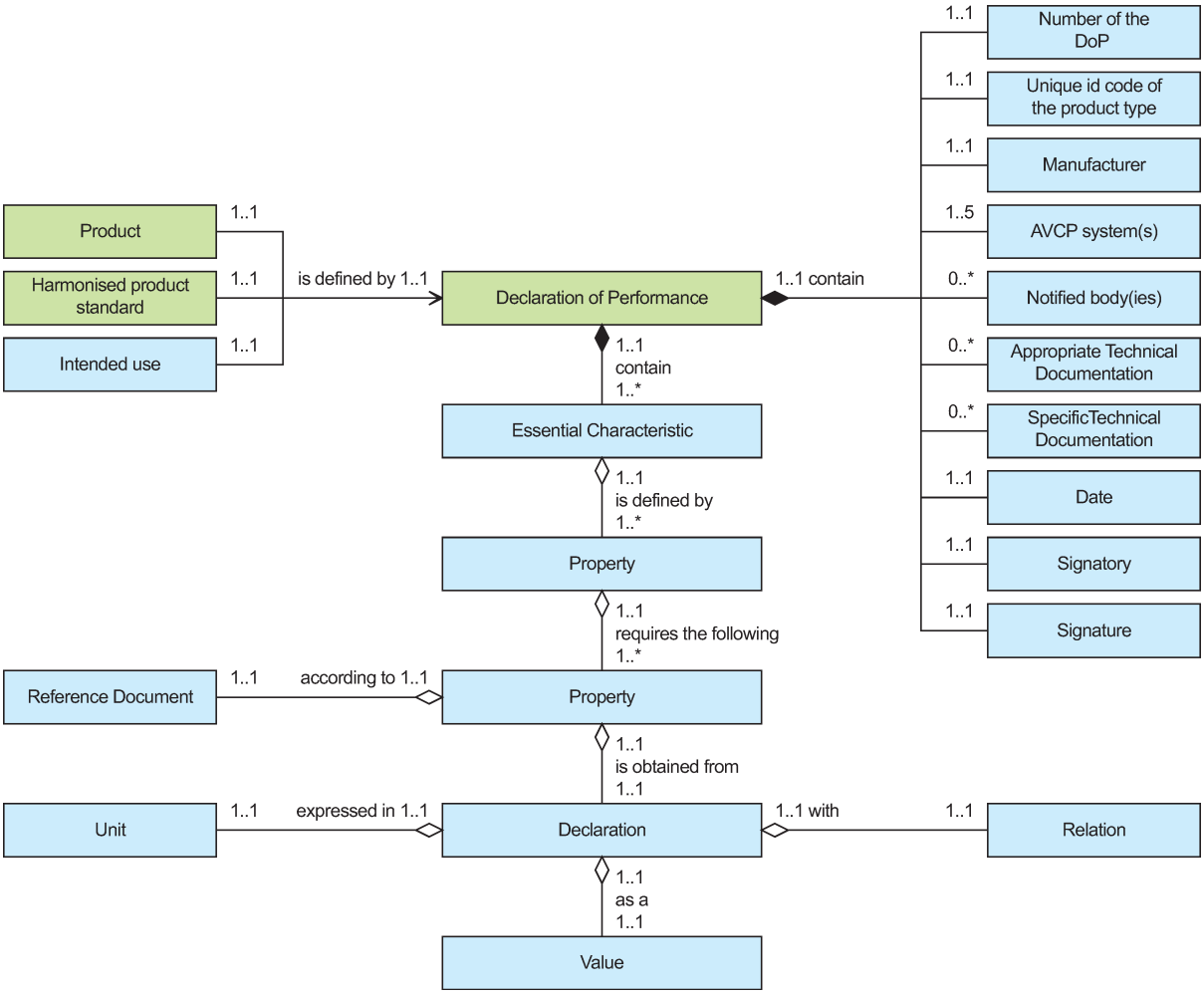

Figure 1 — Smart CE marking UML diagram

6.3 Identification of the XML format

The product specific XML format is defined by the relevant harmonised product standard and the product (in the left of the diagram). At the same time, every XML format will contain specific restrictions to the other elements (formal elements not related to product performance). These restrictions are properly explained in the harmonised product standard but they shall be integrated into the XML and XSD formats.

6.4 Essential characteristics

The structure to declare the performance of essential characteristics (in the centre of the diagram) is generic to facilitate compatibility with other information exchange formats (XML or others). Its development was done in coordination with CEN/TC 442 to keep compatibility with future standards for the exchange of information from construction products.

Harmonised product standards approach performance declaration in different ways: declaration of single or multiple values, performance obtained from two entries tables, declaration based on testing options, etc. To allow all possibilities the structure is open. The definition of every essential characteristic, as identified in the harmonised product standard, is linked to a group of properties that will contain nested property elements. Every nested property element will be linked to a reference

document and will contain a declaration. The structure for declarations is also fixed and requires a value, unit and relation.

The elements for essential characteristics differ from the other, formal elements. While the formal elements are addressed by specific tags, the way tags are used for essential characteristics is generic. The main disadvantage of this approach is, that it is not possible to validate the whole scheme (content) of a Smart CE marking XML files by means of corresponding XSD files ((XML Schema Definition files). The benefits on the other hand are that, the split approach, facilitates product CEN/TCs drafting product specific XML formats and it ensures the compatibility with other applications and developments (BIM data exchange).

The applicable AVCP system could be different for different essential characteristics. All the systems will be included in the element described in 6.6.10 but the link between each specific essential characteristic and its applicable AVCP system is missing. To solve this issue, each property of each essential characteristic shall contain a nested property element for the AVCP system applicable, as described in 6.6.16.

EXAMPLE 1 The AVCP system applicable to all essential characteristics, except reaction to fire, for ventilation ducts is 3. Depending on the product, the AVCP system applicable to reaction to fire can be 1, 3 or 4.

A similar approach is used in case test methods require the declaration of test parameters. The information shall be included in a nested property element within the property for the relevant essential characteristic, as described in 6.6.16.

EXAMPLE 2 The test method for bond strength require the declaration of the mortar used.

EXAMPLE 3 Test method for sealants require the declaration of the conditioning and substrate.

6.5 Legal information

In addition to the essential characteristics, declarations of performance also supply information on the manufacturer, the product, the notified bodies, the applicable AVCP systems, etc. These elements are defined in elements by specific tags and allow XSD validation. Some of this information requires no restriction (e.g. the name of the manufacturer) while other information is restricted (e.g. AVCP systems).

6.6 Description of elements in the declaration of performance

This clause describes in detail the elements included in Smart CE marking XML formats. Annex A contains an example of Smart CE marking XML document according to this format.

6.6.1 XML prolog

XML formats start with a prolog. The XML prolog for Smart CE marking XML formats is the usual one: xml version 1.0 and encoding UTF-8.

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

6.6.2 Root and declaration of performance elements

The second element in XML formats is the root or parent element. It contains additional information within the tag referring to the default namespaces location and the relevant XSD format for its validation, if any.

The root, or parent element of the Smart CE marking XML format is defined using the tag *Declarations*. The opening root tag also contains references to the default namespaces location and to the relevant XSD format for validation.

```
<Declarations xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:noNamespaceSchemaLocation="../xsd/CalciumSilicateMasonryunits.xsd">
…
</Declarations>
```

6.6.3 DoP parent element and language identification

The content of the DoP is included in a parent element. This element is not subject to changes because it identifies the information relevant to the DoP.

It is a complex element that cannot be empty.

The tag to identify the DoP parent element is:

```
<DeclarationOfPerformance xml:lang="en"></DeclarationOfPerformance>
```

The attribute xml:lang="en" identifies the language of the document. The reference language for the XML formats and documents is English. The delivery of XML documents in other languages should be avoided to prevent mistakes and information mismatch. To solve the problem of the different languages, digital correspondence dictionaries will be developed.

6.6.4 XML format identification

The XML format is identified through a simple element. The content is the reference to the harmonised product standard as listed in the Official Journal of the European Union (Commission communication in the framework of the implementation of Regulation (EU) No 305/2011 of the European Parliament and of the Council laying down harmonised conditions for the marketing of construction products and repealing Council Directive 89/106/EEC - Publication of titles and references of harmonised standards under Union harmonisation legislation) including the year and the applicable amendments.

The prefix standardisation bodies place before the letters "EN" (e.g. NF for AFNOR publication in France, BS for BSI publication in UK, DIN for DIN publication in Germany) shall be removed in the reference to avoid they are considered different standards.

When drafting a XML document this element is not subject to changes because it identifies the right format. If the reference does not match with the listed reference in the Official Journal of the European Union the document is not the right one.

It is a simple element that cannot be empty.

The tag to identify the XML format is:

```
<TemplateId></TemplateId>
```

EXAMPLE `<TemplateId>EN_771-2:2011+A1:2015</TemplateId>`

6.6.5 Unique identification code of the product type

The unique identification code of the product-type is a legal entity as defined in Regulation (EU) No 305/2011 [1]. It is defined by the manufacturer without restrictions but usually it is an alphanumeric code.

The restrictions developed for this element are the same for all Smart CE marking XML formats.

It is a simple element that cannot be empty.

The tag to define the unique identification code of the product type is:

<UniqueIdentificationCodeProductType></UniqueIdentificationCodeProductType>

EXAMPLE <UniqueIdentificationCodeProductType>ABC123</UniqueIdentificationCodeProductType>

NOTE The definition of the Unique identification code of the product type for kits may require the development of specific child elements to reflect information from the components. This exception should be assessed during the development of the Smart CE marking XML format.

6.6.6 Number of the declaration of performance

The number of the declaration of performance is its reference number. In practice, it may be a number or an alphanumeric code. The purpose of this element is similar to the unique identification code of the product type

This number may be the same as the unique identification code of the product-type indicated previously, in this case the content of the two elements will be the same.

The restrictions and validations developed for this element are the same for all Smart CE marking XML formats.

It is a simple element that cannot be empty.

The tag to define the number of the declaration of performance is:

<DoPNumber></DoPNumber>

EXAMPLE <DoPNumber>ABC123</DoPNumber>

6.6.7 Intended use/es

The intended uses are defined in the relevant harmonised product standard. Usually more than one intended use is possible. The content of this element is limited to the different options provided by the harmonised product standard so it is not open.

The restrictions and validations for this element are specific for each Smart CE marking XML format.

It is a simple element that cannot be empty. Some harmonised product standards may allow more than one intended use, in this case the element can be repeated for each intended use, as described in the harmonised standard and according to the limitations agreed by the product CEN/TC and reflected in the Smart CE marking XML format.

Intended use/es may be related to the applicable AVCP systems so consistency between these element, the element described in 6.6.10 and the nested property for AVCP systems in the declared performance described in 6.6.16 shall be verified.

The tag to define the intended use/es is:

```
<IntendedUse></IntendedUse>
```

EXAMPLE
```
<IntendedUse>In protected masonry walls, columns and partitions</IntendedUse>
```

6.6.8 Manufacturer

Manufacturer is a complex element to provide compulsory information about the manufacturer of the product including name, contact address and other relevant information.

The restrictions and validations developed for this element are the same for all Smart CE marking XML formats.

It is a complex element. Only the first five child elements (name, address, town, zip and country) cannot be empty.

The structure of the element manufacturer is:

```
<Manufacturer>
    <Name></Name>
    <Address></Address>
    <Town></Town>
    <ZIP></ZIP>
    <Country></Country>
    <Email></Email>
    <Phone></Phone>
    <Website></Website>
    <Logo></Logo>
</Manufacturer>
```

EXAMPLE
```
<Manufacturer>
    <Name>Manufacturer</Name>
    <Address>Bld du Souverain 68</Address>
    <Town>Brussels</Town>
    <ZIP>1170</ZIP>
    <Country>Belgium</Country>
    <Email>info@construction-products.eu</Email>
    <Phone>+32(0)24634957</Phone>
    <Website>https://www.construction-products.eu/</Website>
    <Logo>http://www.construction-products.eu/logo.png</Logo>
</Manufacturer>
```

6.6.9 Authorised representative

The element authorised representative shares the same internal structure of the element manufacturer but it is applicable only in case an authorised representative has been designated.

The restrictions and validations developed for this element are the same for all Smart CE marking XML formats.

It is a complex element. All the child elements can be empty.

The structure of the element manufacturer is:

```
<AuthorisedRepresentative>
    <Name></Name>
    <Address></Address>
    <Town></Town>
    <ZIP></ZIP>
    <Country></Country>
    <Email></Email>
    <Phone></Phone>
    <Website></Website>
    <Logo></Logo>
</AuthorisedRepresentative>
```

EXAMPLE
```
<AuthorisedRepresentative>
    <Name>Authorised representative</Name>
    <Address>C/ Muro 16</Address>
    <Town>Madrid</Town>
    <ZIP>28080</ZIP>
    <Country>Spain</Country>
    <Email>info@construction-products.eu</Email>
    <Phone>+32(0)24634957</Phone>
    <Website>https://www.construction-products.eu/</Website>
    <Logo>http://www.construction-products.eu/logo.png</Logo>
</AuthorisedRepresentative>
```

6.6.10 System/s of AVCP

The system or systems of assessment and verification of constancy of performance (AVCP) of the construction product is relevant information from construction products. Some products are covered by a single AVCP system but others require the declaration of multiple systems. The content of this complex element is limited to the different options provided by Regulation (EU) No 305/2011[1] and by Commission Delegated Regulation (EU) No 568/2014 [4] . The valid values are "1+", "1", "2+", "3" and "4".

While the valid values are the same for all Smart CE marking XML formats only some of them are applicable to some harmonised product standard.

EXAMPLE 1 Fire performance is usually following specific AVCP systems so the applicable AVCP system for essential characteristics related to fire is one while another is applicable to the rest. In this situation both AVCP systems are included in the XML format.

It is a complex element. At least one child element cannot be empty.

The structure of the element system/s of AVCP is:

```
<SystemsOfAVCP>
    <AVCP></AVCP>
</SystemsOfAVCP>
```

EXAMPLE 2
```
<SystemsOfAVCP>
    <AVCP>2+</AVCP>
</SystemsOfAVCP>
```

Essential characteristics contain the AVCP system applicable to them (see 6.6.16). This repetition is justified by the fact that different AVCP systems can apply to different essential characteristics and for the same essential characteristic different AVCP systems can be chosen according to the regulatory provision for each specific product.

More than one AVCP system can be declared for the DoP but only one AVCP system can be declared for each property 2 for each essential characteristic (see 6.6.16).

6.6.11 Harmonised standard

The element harmonised standard contains the legal reference to the harmonised product standard.

The content of the element described in clause 6.6.3 is the same as the content of this element. The information is included twice to keep consistency with the Commission Delegated Regulation (EU) No 574/2014 [3] and because the development of Smart CE marking XML formats following harmonised technical specifications developed by EOTA (European Assessment Documents) may require a different content for these two elements.

The restrictions and validations developed for this element are specific for each Smart CE marking XML format, verification that the content is the same than the element 6.6.3.

It is a simple element that cannot be empty for products following the CEN route, and shall be empty for products under the EOTA route.

The tag to define the harmonised standard is:

```
<HarmonisedStandard></HarmonisedStandard>
```

EXAMPLE `<HarmonisedStandard>`EN 771-2:2011+A1:2015`</HarmonisedStandard>`

6.6.12 Notified body/ies

When assessing the performance of construction products under AVCP systems 1+, 1, 2+ and 3 a notified body or more than one need to be contracted. The element is complex and contains a nested complex element for each notified body (NB). The name and the number of the notified bodies are included in the format as a simple element within the notified body element.

The restrictions and validations developed for this element are the same for all Smart CE marking XML formats.

It is a complex element. Only can be empty if the unique AVCP system applicable is 4 but this conditional restriction is not applicable in the XML format or in the XSD format.

The structure of the element notified body is:

```
<NotifiedBodies>
    <NB>
        <NBName></NBName>
        <NBNumber></NBNumber>
    </NB>
</NotifiedBodies>
```

EXAMPLE
```
<NotifiedBodies>
  <NB>
    <NBName>NB1 name</NBName>
    <NBNumber>NB1 number</NBNumber>
  </NB>
</NotifiedBodies>
```

6.6.13 European Assessment Document

This element was included to keep consistency with the Commission Delegated Regulation (EU) No 574/2014 [3] and to facilitate the development of XML formats for products following harmonised technical specifications developed by EOTA (European Assessment Documents). The approach to fill this information is the same applied for the declaration of the harmonised standard (see 6.6.11 and 6.6.4).

It is a simple element that can be empty for products following the CEN route. For products following the EOTA route, this element cannot be empty.

The tag to define the European Assessment Document is:

<EuropeanAssessmentDocument></EuropeanAssessmentDocument>

6.6.14 European Technical Assessment

This element was included to keep consistency with the with the Commission Delegated Regulation (EU) No 574/2014 [3] and to facilitate the development of XML formats for products following harmonised technical specifications developed by EOTA (European Assessment Documents).

It is a simple element that can be empty for products following the CEN route. For products following the EOTA route, this element cannot be empty.

The tag to define the European Technical Assessment is:

<EuropeanTechnicalAssessment></EuropeanTechnicalAssessment>

6.6.15 Technical Assessment Body

This element was included to keep consistency with the with the Commission Delegated Regulation (EU) No 574/2014 [3] and to facilitate the development of XML formats for products following harmonised technical specifications developed by EOTA (European Assessment Documents).

It is a simple element that can be empty for products following the CEN route. For products following the EOTA route, this element cannot be empty.

The tag to define the Technical Assessment Body is:

<TechnicalAssessmentBody></TechnicalAssessmentBody>

6.6.16 Declared performance/s

The core of the declaration of performance is included within a complex element:

<DeclaredPerformance></DeclaredPerformance >

As explained before the structure of this element is different from the rest. It is a generic approach to facilitate the adaptation to the needs of product CEN/TC and to grant compatibility with standards developed by CEN/TC 442 on exchange of information.

The restrictions to be applied to this element and its children are summarised in Figure 2 — UML diagram for the declaration of essential characteristics.

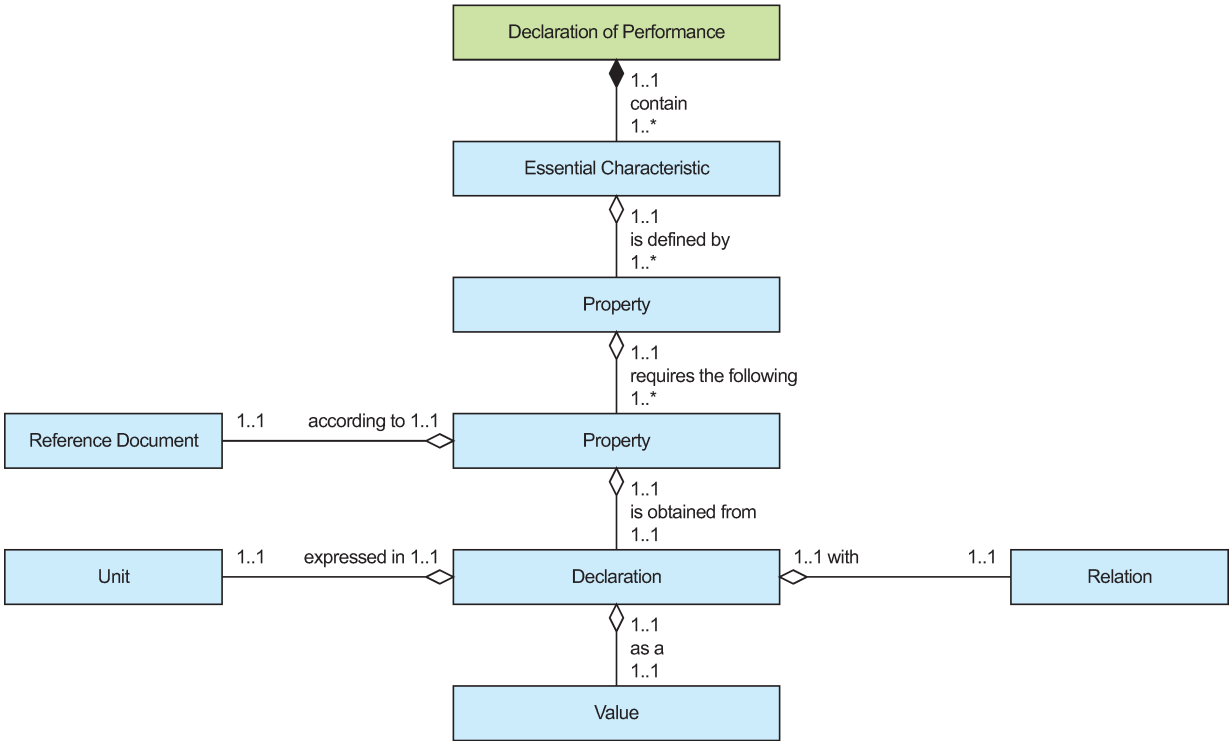

Figure 2 — UML diagram for the declaration of essential characteristics

There is at least one essential characteristic (usually much more). The list is available in the harmonised product standard. The names of the essential characteristics shall be consistent with the names included in the harmonised standard.

EXAMPLE 1 Essential characteristic: Compressive strength.

Each essential characteristic contains always at least, one property level 1 as children element, usually more than one. The element property level 1 is defined by the tag "property".

The names of properties level 1 shall be consistent with the concepts reflected in the standard. In case there is only one applicable property level 1 the names of the property level 1 and the relevant essential characteristic may be the same but if more than one property level 1 is needed the name shall differentiate them.

NOTE When the name of the essential characteristic defines the property, consistency requires that the relevant property level 1 has the same name than the essential characteristic.

EXAMPLE 2 Properties level 1 for the essential characteristic compressive strength: Perpendicular to bed faces, perpendicular to header and perpendicular to face, see Figure 3 — Example of properties level 1 for the essential characteristic compressive strength.

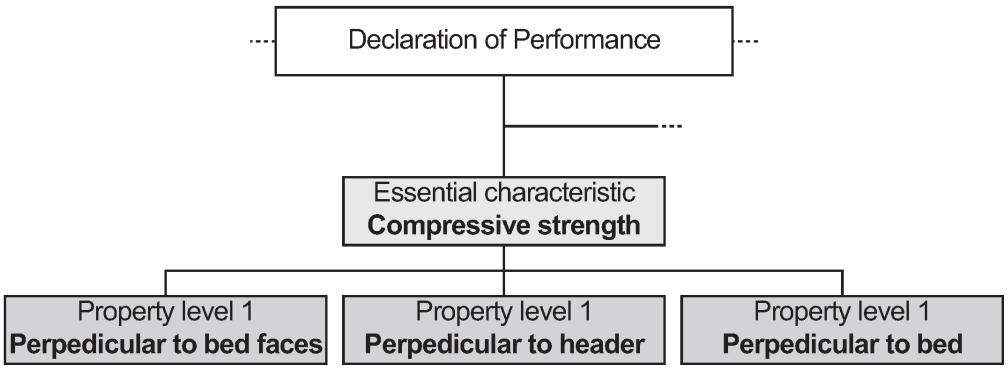

Figure 3 — Example of properties level 1 for the essential characteristic compressive strength

Each child property level 1 for each essential characteristic contains always, at least, one nested property level 2 within. This is the second element property in the diagram. Both levels are necessary to properly reflect product performance and at least one element of each level shall be present. The last property level 2 for each property level 1 shall be AVCP and define the relevant AVCP for the property level 1.

The names of properties level 2 shall be consistent with the concepts reflected in the standard. In case there is only one property level 1 the names of the property level 1 and the relevant essential characteristic may be the same but if more than one property level 1 is needed the name shall differentiate them.

EXAMPLE 3 Properties level 2 for the property level 1 perpendicular to bed faces within the essential characteristic compressive strength: Type of specimen, category, mean, normalised and AVCP system, see Figure 4 — Example of properties level 2 for the property level 1 perpendicular to bed faces.

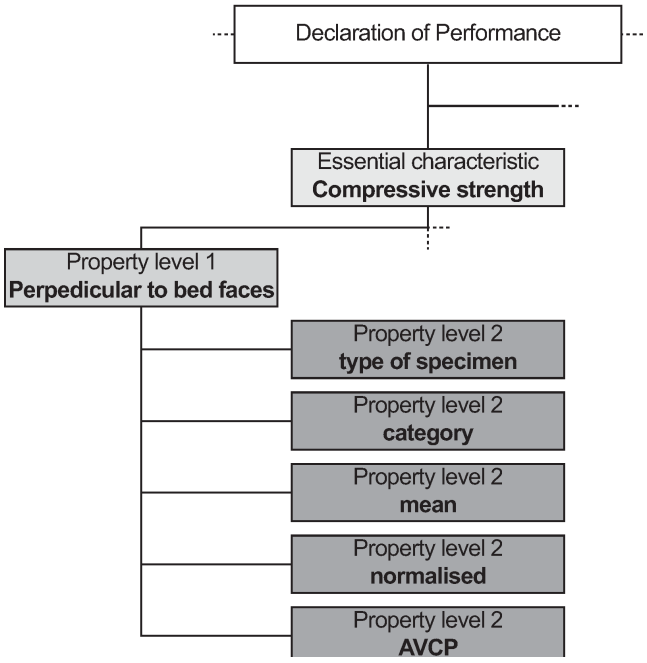

Figure 4 — Example of properties level 2 for the property level 1 perpendicular to bed faces

Each child property level 2 of each property level 1 linked to each essential characteristic contains a reference document element, this element defines the technical specification where the instructions to assess the performance are available (usually standards).

Each child property of each property linked to each essential characteristic also contains a declaration complex element containing single elements for value, unit and relation.

EXAMPLE 4 Declaration for the property mean value - Compressive strength – perpendicular to bed faces: Value – a number; Unit – N/mm2; Relation – Greater than or equal to, see Figure 5 — Example of declaration of mean value.

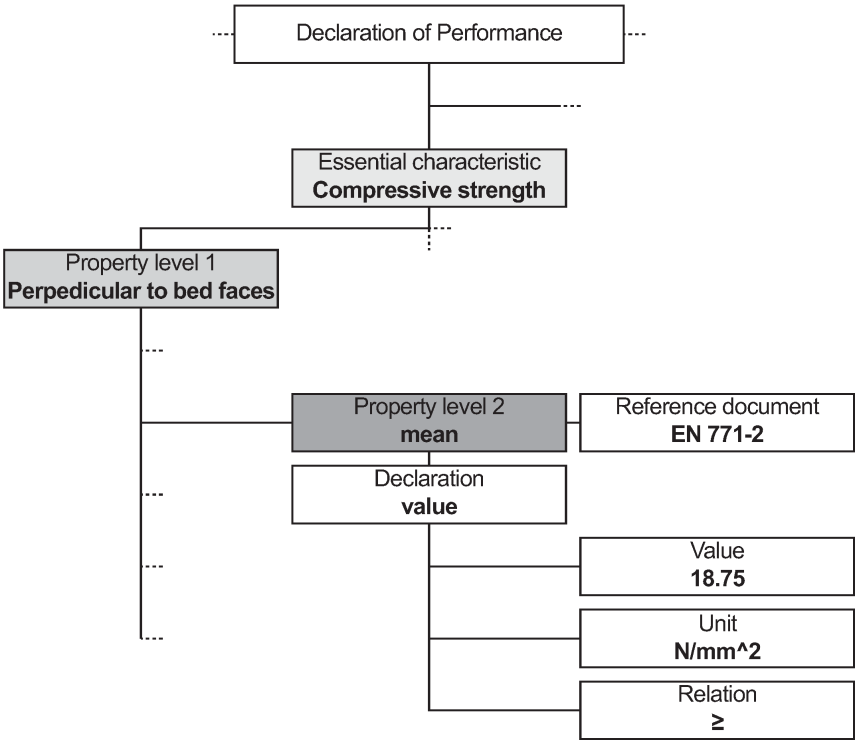

Figure 5 — Example of declaration of mean value

The structure of the element declared performance is:

```
<EssentialCharacteristic>
    <Name></Name>
    <Property>
        <Name></Name>
        <Property>
            <Name></Name>
            <ReferenceDocument></ReferenceDocument>
            <Declaration>
                <Name></Name>
                <Value></Value>
                <Unit></Unit>
                <Relation></Relation>
            </Declaration>
        </Property>
    </Property>
</EssentialCharacteristic>
```

EXAMPLE 5 The structure provided in the previous paragraph would be presented in a Smart CE marking XML document according to Figure 6 — Example of the complete property level 1 compressive strength perpendicular to bed faces, as follows:

```
<EssentialCharacteristic>
    <Name>Compressive strength</Name>
        <Property>
            <Name>Perpendicular to bed faces</Name>
            <Property>
                <Name>type of specimen</Name>
                <ReferenceDocument>EN 771-2</ReferenceDocument>
                <Declaration>
                    <Name>type</Name>
                    <Value>whole unit</Value>
                    <Unit>unitless</Unit>
                    <Relation>category</Relation>
                </Declaration>
            </Property>
            <Property>
                <Name>category</Name>
                <ReferenceDocument>EN 771-2</ReferenceDocument>
                <Declaration>
                    <Name>category</Name>
                    <Value>I</Value>
                    <Unit>unitless</Unit>
                    <Relation>category</Relation>
                </Declaration>
            </Property>
            <Property>
                <Name>mean</Name>
                <ReferenceDocument>EN 772-1</ReferenceDocument>
                <Declaration>
                    <Name>value</Name>
                    <Value>18.75</Value>
                    <Unit>N/mm^2</Unit>
                    <Relation>greater than or equal to</Relation>
                </Declaration>
            </Property>
            <Property>
                <Name>normalised</Name>
                <ReferenceDocument>EN 772-1</ReferenceDocument>
                <Declaration>
                    <Name>value</Name>
                    <Value>15.33</Value>
                    <Unit>N/mm^2</Unit>
                    <Relation>greater than or equal to</Relation>
                </Declaration>
            </Property>
            <Property>
                <Name>AVCP</Name>
                <ReferenceDocument></ReferenceDocument>
                <Declaration>
                    <Name>system</Name>
                    <Value>2+</Value>
                    <Unit>unitless</Unit>
                    <Relation>category</Relation>
                </Declaration>
            </Property>
        </Property>
        <Property>
            <Name>Perpendicular to header</Name>
        ...
```

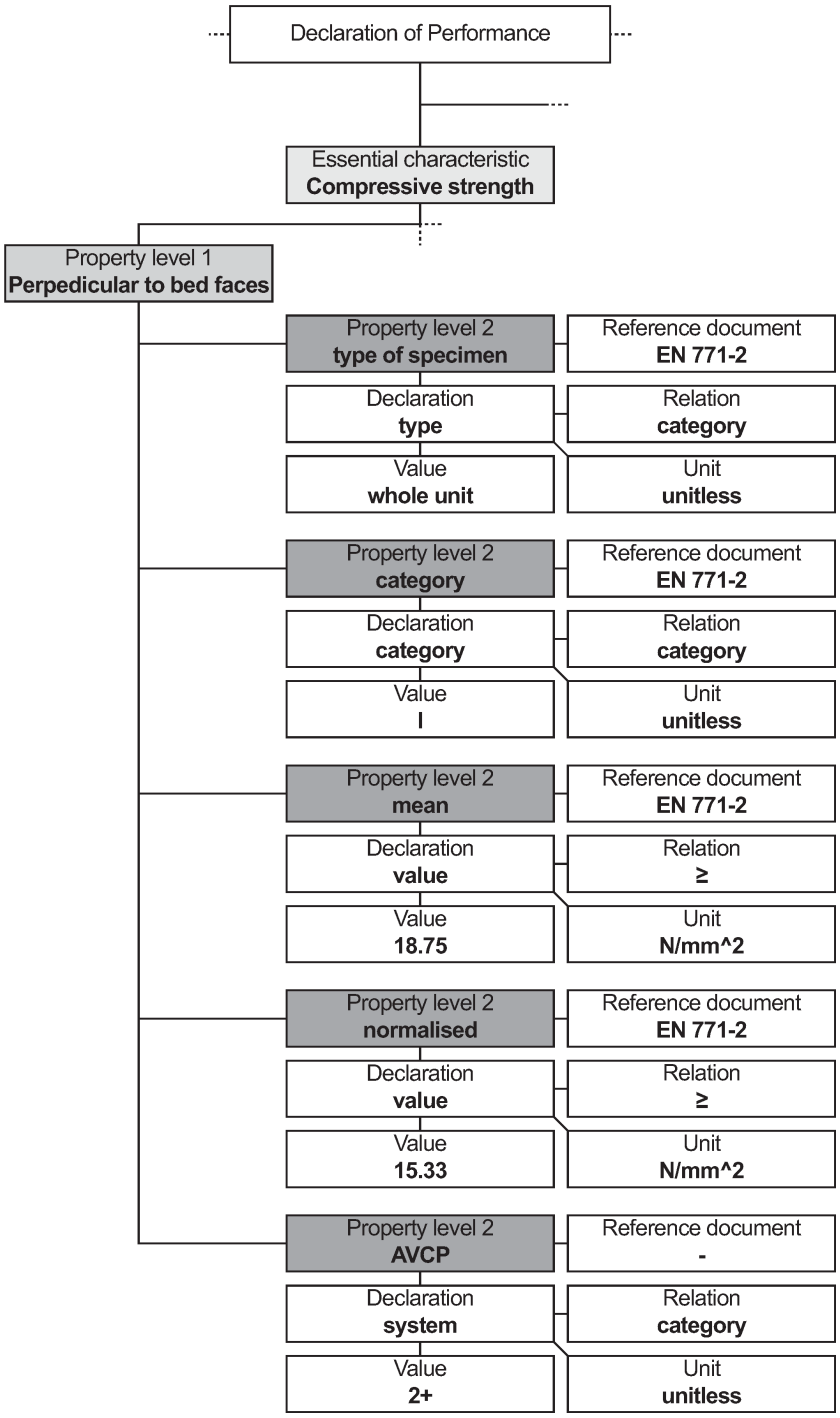

Figure 6 — Example of the complete property level 1 compressive strength perpendicular to bed faces

Product CEN/TC will use this structure to develop the Smart CE marking XML format for each standard. The system is flexible enough to be adapted to the requirements of the CEN/TC while keeping fixed the structure. CEN/TC may use the structure to declare the link to a picture with the dimensions, the relevant information to define the test conditions or any other additional parameter of piece of information required to fulfil the regulatory requirements.

EXAMPLE 6 Introduction of the link to a picture of the product including shape and features:

```
<Property>
    <Name>Shape and features</Name>
    <Property>
        <Name>shape and features</Name>
        <ReferenceDocument>EN 771-2</ReferenceDocument>
        <Declaration>
            <Name>file</Name>
            <Value>http://www.construction-products.eu/logo.png</Value>
            <Unit>unitless</Unit>
            <Relation>file</Relation>
        </Declaration>
    </Property>
</Property>
```

The introduction of GUID references in this structure is possible either by adding them as additional elements (e.g. GUID to define the name of the essential characteristic) or as attributes to the existing elements (e.g. GUID to define the units). But the details on how to develop GUIDs or manage them is out of the scope of this document. The introduction of GUIDs in the format does not allow to remove or replace any tag or content of the element. GUIDs information will be additional and the tags and content of the element will be always provided in English.

EXAMPLE 7 GUIDs are included to define length (name GUID), to define the reference document (reference document GUID) and units (unit GUID):

```
<Property>
    <Name>dimensions</Name>
    <Property>
        <Name>length </Name>
        <GUID>3vHhqmoT0Hsm00051Mm008</GUID>
        <ReferenceDocument GUID="3bhhlYovD1xOzSEP5n2HRY">EN 772-1</ReferenceDocument>
        <Declaration>
            <Name>value</Name>
            <Value>300</Value>
            <Unit GUID="1GkM_00mOHtG0000PR1IRl">mm</Unit>
            <Relation>equal to</Relation>
        </Declaration>
    </Property>
</Property>
```

6.6.17 Appropriate Technical Documentation and/or Specific Technical Documentation

This point is filled in a declaration of performance if Appropriate Technical Documentation and/or Specific Technical Documentation has been used, in accordance with the simplified procedures available in Regulation (EU) No 305/2011 [1]. Both elements are complex and contain nested complex elements for each Documentation. The reference number of the Specific and/or Appropriate Technical Documentation used and the requirements with which the product complies are included in the format as simple elements within the documentation element.

Few restrictions can be applied to these elements because manufacturers can define their own reference number and description of the requirements, in any case the restrictions and validations developed for this element are the same for all Smart CE marking XML formats.

It is a complex element that can be empty.

The structure of the element Appropriate Technical Documentation and/or Specific Technical Documentation is:

```
<AppropriateTechnicalDocumentation>
    <ATD>
        <ATDReferenceNumber></ATDReferenceNumber >
        <ATDRequirements></ATDRequirements >
    </ATD>
</AppropriateTechnicalDocumentation>
<SpecificTechnicalDocumentation>
    <STD>
        <STDReferenceNumber></STDReferenceNumber >
        <STDRequirements></STDRequirements >
    </STD>
</SpecificTechnicalDocumentation>
```

6.6.18 Signature

Declarations of performance contain the following statement:

The performance of the product identified above is in conformity with the set of declared performance/s. This declaration of performance is issued, in accordance with Regulation (EU) No 305/2011, under the sole responsibility of the manufacturer identified above.

Signed for and on behalf of the manufacturer by:

They also contain elements related to the signature, four elements are required: name, place of issue, date of issue and signature.

The first three elements are simple elements with the default restrictions for the type of information they contain. They cannot be empty.

```
<Name></Name>
<Place></Place>
<Date></Date>
```

There is a lot of information available about the signature of XML documents. It requires the introduction of a signature complex element. Depending on the requirements and the methods used, the content of this element may differ but in general it is an element including a value generated from the application of a private key to a message via a cryptographic algorithm and additional elements to properly develop and verify the signature.

```
<Signature>
        …
</Signature>
```

Regulation (EU) No 305/2011 [1] requires the official signature of the DoP. Manufacturers shall find a way to ensure that the signature of the digital document (Smart CE marking XML document) is compliant with the requirements of the regulation and any applicable National provision. If the relevant PDF document is signed and the link is included in the element described in clause 6.6.19.4, no additional signature is required and this element (Signature) can be empty.

6.6.19 Additional information requirements

6.6.19.1 General

CPR requires the delivery of instructions and safety information and REACH information together with the DoP. The XML format will contain specific elements to deliver the link to these pieces of information and to the PDF version of the DoP.

6.6.19.2 Instructions and safety information

Instructions and safety information are included as links to different relevant documents.

The restrictions and validations developed for this element are the same for all Smart CE marking XML formats.

It is a complex element that can be empty.

The structure of the element instructions and safety information is:

```
<InstructionsAndSafetyInformation>
    <Link></Link>
</InstructionsAndSafetyInformation>
```

6.6.19.3 REACH information

When applicable, REACH information is included as links to different relevant documents.

The restrictions and validations developed for this element are the same for all Smart CE marking XML formats.

It is a complex element that can be empty.

The structure of the element REACH information is:

```
<REACHInformation>
    <Link></Link>
</REACHInformation>
```

6.6.19.4 DoP link

The link to the DoP available only can be included in the DoP.

The restrictions and validations developed for this element are the same for all Smart CE marking XML formats.

It is a simple element that can be empty.

The structure of the element DoPLink is:

```
<DoPLink></DoPLink>
```

7 Product CEN/TC expected actions

Product CEN/TC have the required expertise to develop product specific smart CE marking XML formats in accordance with the general principles described in this document. The principles to develop the Smart CE marking XML document for the declared performances are different to those for the other, formal elements of a DoP. As explained before, while the essential characteristic and their declared performances are addressed using a generic approach, the formal elements are defined by specific tags that may be validated.

7.1 Validation of common elements

Product CEN/TC experts developing product specific smart CE marking XML formats shall check the valid content of the elements with restrictions defined in the harmonised product standard. The following elements shall be checked:

7.1.1 Intended use/es

The content of this element is limited to the different options provided by the harmonised product standard. Some harmonised product standards may allow more than one intended use, in this case all possible combinations should be included in and one or more than one element predefined as potential options when filling the XML format.

7.1.2 System/s of AVCP

Some products are covered by a single AVCP system but others require the declaration of multiple systems. The valid AVCP systems to be applied to the product shall be fixed. The AVCP systems declared in the relevant element shall be consistent with the AVCP systems declared in the declared performance.

7.1.3 Harmonised standard

The content of this element shall match the official reference of the harmonised product standards as it was cited in the Official Journal of the European Union.

7.1.4 Notified body/ies

For products only under AVCP system 4 this element shall be empty because notified bodies are not contracted to develop any task.

7.2 Structure of declared performance/s' elements

The approach to the declared performance is different. The fixed structure allows product CEN/TC to work in a simplified way by filling a table that can be translated into the XML format. The content to be filled is shown in Table 1 — Declared performance model table.

Table 1 — Declared performance model table

Essential characteristic <Name>	Properties 1st level <Name>	Properties 2nd level <Name>	<Reference Document>	Declaration <Name>	<Value>	<Unit>	<Relation>

This table could also contain reference to the relevant GUID if the structure is amended to allow their introduction as explained in clause 6.6.16.

Product CEN/TC shall consider the following when filling the table:

— Essential characteristics shall be displayed as defined in the harmonised product standard.

— For the same essential characteristic, more than one property level 1 is possible.

— For every property level 1 more than one property level 2 is possible.

— For every property at level 2 only one reference document, one declaration (name), one value, one unit, and one relation is possible.

— Every property level 1 shall contain a property level 2 in the last place for the relevant AVCP system applied to the property level 1. The structure of this level 2 property (AVCP) is the same structure used for the other properties level 2:

```
<Property>
    <Name></Name>
    <ReferenceDocument> </ReferenceDocument>
    <Declaration>
        <Name></Name>
        <Value></Value>
        <Unit></Unit>
        <Relation></Relation>
    </Declaration>
</Property>
```

EXAMPLE The examples provided in previous clauses for the essential characteristic compressive strength for calcium silicate masonry units are presented in Table 2 — Declared performance table and in Figure 7 — Declared performance diagram:

Table 2 — Declared performance table

Essential characteristic <Name>	Property level 1 <Name>	Property level 2 <Name>	<Reference Document>	Declaration <Name>	<Value>	<Unit>	<Relation>
Compressive strength	Perpendicular to bed faces	type of specimen	EN 771-2	type	whole unit	unitless	category
		category	EN 771-2	category	I	unitless	category
		mean	EN 772-1	value	18.75	N/mm^2	greater than or equal to
		normalised	EN 772-1	value	15.33	N/mm^2	greater than or equal to
		AVCP		system	2+	unitless	category
	Perpendicular to header	type of specimen	EN 771-2	type		unitless	category
		category	EN 771-2	category		unitless	category
		mean	EN 772-1	value		N/mm^2	greater than or equal to
		normalised	EN 772-1	value		N/mm^2	greater than or equal to
		AVCP		system	2+	unitless	category
	Perpendicular to bed	type of specimen	EN 771-2	type		unitless	category
		category	EN 771-2	category		unitless	category
		mean	EN 772-1	value		N/mm^2	greater than or equal to
		normalised	EN 772-1	value		N/mm^2	greater than or equal to
		AVCP		system	2+	unitless	category

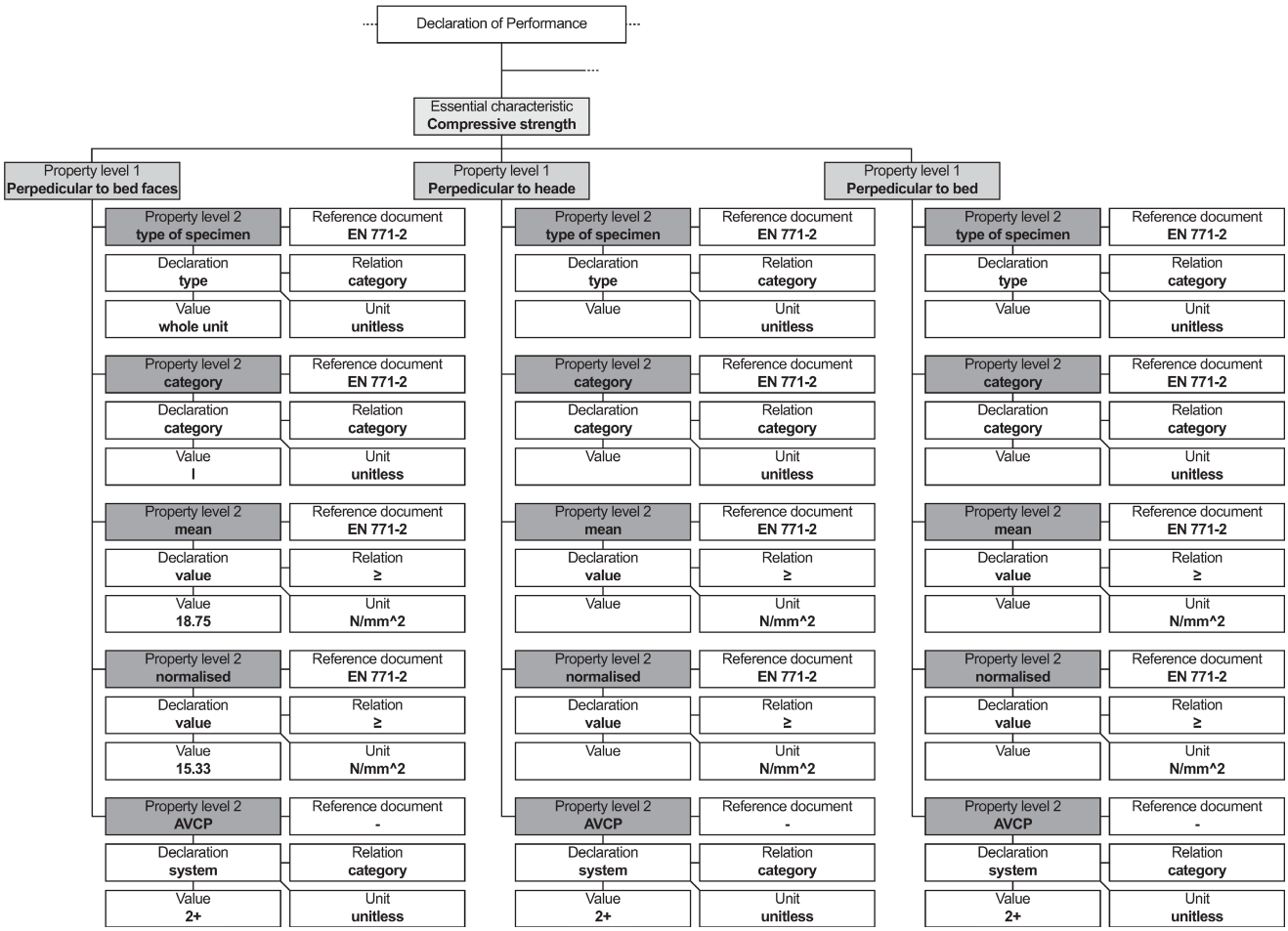

Figure 7 — Declared performance diagram

Annex B contains an example of table for a specific Smart CE marking XML document.

7.3 Additional parameters

The declaration of the performance of some essential characteristics depends on additional assessment parameters. The lack of this information could lead to misinterpretations or errors.

The additional parameters shall be included using the same structure according to the following rules:

— There is no limitation to the number of parameters;

EXAMPLE 1 The declaration of the tested bond strength requires the declaration of the mortar type used for testing. It is done by declaring the type of mortar and, if required, the manufacturer and DoP number.

— The parameters are property level 2 and shall not be displayed either as essential characteristics, or properties level 1;

— When applicable to different essential characteristics or properties level 2, the additional parameters shall be repeated;

EXAMPLE 2 Some tests are developed on a substrate (sealants). This information is relevant to the result so a property level 2 shall be included for each property level 1 reporting the substrate. The limitation to use the same substrate for all the tests cannot be introduced in the format but shall be considered by the manufacturer when drawing up the DoP;

— The introduction of parameters is not required if the assessment does not allow to choose between different options;

— Additional parameters require additional efforts to process the information so it should be avoided as much as possible to benefit from software management and interpretation.

8 Smart CE marking for products covered by the CPR and other regulations

8.1 General

Some products are CE marked according to two or more harmonised standards. The following situations can occur:

8.2 More than one harmonised standard according to the CPR

When standards are harmonised according to the CPR, manufacturers are obliged to label the product with CE marking and draw up a DoP according to each of them. The current market practice is to develop a single DoP document containing the declaration according to all the standards but this approach could reduce the readability of the documents by machines.

XML formats will be available according to each harmonised standard but not for each combination. Manufacturers should deliver a separate XML document according to each harmonised standard.

EXAMPLE Products covered by EN 14351-1:2006+A2:2016 Windows and external pedestrian doorsets and EN 12101-2:2003 Specification for natural smoke and heat exhaust ventilators

8.3 Harmonised standards according to the CPR and other legislations

When standards are harmonised according to the CPR and other directives or regulations, only those harmonised according to the CPR are obliged to draw up a DoP.

XML formats will be available only for the harmonised standards according to the CPR but not for the harmonised standards according to other regulations. Manufacturers should deliver a separate XML document according to each harmonised standard according to the CPR and fulfil the obligations from the other regulations or directives independently.

EXAMPLE Products covered by EN 50575:2014+A1:2016 Power, control and communication cables (CPR) and EN 5025-2-31:2011 Low voltage energy cables with thermoplastic PVC insulation (Low Voltage Directive).

9 Smart CE glossary of tags

The following tags ordered in alphabetical order are used in Smart CE marking XML formats and define the related elements. This glossary also shows valid contents for the element defined by these tags.

9.1
<Address>
This simple element contains the address where the manufacturer or authorised representative (depending on the parent element) is located.

9.2
<AppropriateTechnicalDocumentation>
This complex element contains the references to the related documents.

9.3
<ATDReferenceNumber>
This simple element contains a reference to one of the documents of the manufacturer including this information. This element is a child element of <AppropriateTechnicalDocumentation>.

9.4
<ATDRequirements>
This simple element contains a summary of the provisions fulfilled to benefit from the simplifications included in the appropriate technical documentation.

9.5
<AVCP>
This simple element contains a AVCP system applicable to the product. It is a child element of <SystemsOfAVCP>. The possible content for this element is:

— 1+

— 1

— 2+

— 3

— 4

9.6
<Country>
This simple element contains the country where the manufacturer or authorised representative (depending on the parent element) is located.

9.7
<Date>
This simple element contains the date when the DoP was signed.

9.8
<DeclarationOfPerformance>
This complex element contains the declaration of performance according to Regulation (EU) No 305/2011 [1]. It also contains the reference to the language, English for Smart CE marking XML formats and documents: xml:lang="en".

9.9
<Declarations>
This complex element is the root element. The attributes of this tag are the default namespaces location which is usually a default link and the reference to the validation XSD.

9.10
<DeclaredPerformance>
This complex element contains the essential characteristics according to the structure.

9.11
<DoPNumber>
This simple element contains the number of the DoP defined by the manufacturer according to the regulatory provisions.

9.12
<DoPLink>
This simple element contains the online link to the declaration.

9.13
<Email>
This simple element contains the email of the manufacturer or authorised representative (depending on the parent element).

9.14
<EssentialCharacteristic>
This complex element contains the information related to an essential characteristic. It is a child element of <DeclaredPerformance>.

9.15
<EuropeanAssessmentDocument>
This simple element contains the reference to the applicable European Assessment Document. For products according to harmonised standards, it is empty.

9.16
<EuropeanTechnicalAssessment>
This simple element contains the reference to the relevant European Technical Assessment. For products according to harmonised standards, it is empty.

9.17
<HarmonisedStandard>
This simple element contains the legal reference to the harmonised product standard as listed in the Official Journal of the European Union, including the year and the applicable amendments. The content is the same than element <TemplateId> for products following the CEN route. For products following the EOTA route, it is empty.

9.18
<Intended use>
This simple element contains the intended use covered by the document. If more than one intended use is possible, the element may be repeated.

9.19
<InstructionsAndSafetyInformation>
This complex element contains the elements related to instructions and safety information provided by the manufacturer.

9.20
<Link>
This simple element contains the link to a relevant file. It is the child element of other complex elements (e.g. InstructionsAndSafetyInformation and REACHInformation).

9.21
<Logo>
This simple element contains the link to the logo of the manufacturer or authorised representative (depending on the parent element).

9.22
<Manufacturer>
This complex element contains the information related to the manufacturer.

9.23
<Name>
This simple element defines the name of other simple or complex elements (e.g. <Manufacturer>, <AuthorisedRepresentative>, <Property>, <Declaration> and name of the signatory). It is necessary to properly identify them in the structure.

The name related to the elements essential characteristic shall be consistent with the content of Annex ZA of the relevant harmonised standard.

The name related to the elements property level 1 shall be in line with the technical performance and detailed enough to clearly identify the property.

The name related to the elements property level 2 shall not be written in capital letters unless the text is an acronym widely identifiable (e.g. AVCP and DoP).

The name related to the elements declaration shall be as simple as possible and shall not be written in capital letters unless they are acronyms widely identified (e.g. AVCP and DoP).

9.24
<NB>
This complex element contains the information of every notified body listed in the declaration of performance.

9.25
<NBName>
This simple element contains the name of one of the notified bodies referred in the document in the original language of the Member State where it was notified. It is a child element of <NB>.

9.26
<NBNumber>
This simple element contains the official number assigned to one of the notified bodies referred in the document. It is a child element of <NB>.

9.27
<NotifiedBodies>
This complex element contains the information about the notified bodies listed in the declaration of performance.

9.28
<Phone>
This simple element contains the telephone of the manufacturer or authorised representative (depending on the parent element).

9.29
<Place>
This simple element contains the place where the DoP was signed.

9.30
<Property>
This complex element is used as first or second level within the element <EssentialCharacteristic>. It allows the declaration of simple and interrelated values such as two entry tables, testing conditions, specimen selection, etc.

9.31
<REACHInformation>
This complex element contains the elements related to REACH information.

9.32
<ReferenceDocument>
This simple element contains the reference document describing how the declared performance is obtained. It will be usually a standard but could also be a legal publication or any other document as defined in the relevant harmonised product standard. In case it contains a referent to a standard, it is up to the product CEN/TC to decide if the reference to the standard is dated or not.

9.33
<Relation>
This simple element reflects the relation between the declared value and the real performance of the product as defined in the relevant harmonised product standard. The possible content for this element is:

— class: according to the definition in Regulation (EU) No 305/2011 [1]

EXAMPLE 1 Fire reaction classes.

— category: when the declaration is not a class but it is already defined

EXAMPLE 2 AVCP systems.

— equal to: =

— greater than: >

— greater than or equal to: ≥

— less than: <

— less than or equal to: ≤

— plus minus: ±

— description: text describing the compliance

— file: reference is available in a file

9.34
<SystemsOfAVCP>
This complex element contains all the AVCP systems applicable to the product. It is the generic information included out of the declared performance.

9.35
<TechnicalAssessmentBody>
This simple element contains the reference to the Technical Assessment Body issuing the European Technical Assessment. For products according to harmonised standards, it is empty.

9.36
<Town>
This simple element contains the town where the manufacturer or authorised representative (depending on the parent element) is located.

9.37
<SpecificTechnicalDocumentation>
This complex element contains the references to the related documents.

9.38
<Statement>
This simple element contains the predefined text to be included in the DoP: "The performance of the product identified above is in conformity with the set of declared performance/s. This declaration of performance is issued, in accordance with Regulation (EU) No 305/2011, under the sole responsibility of the manufacturer identified above".

9.39
<STDReferenceNumber>
This simple element contains a reference to one of the documents of the manufacturer including this information. This element is a child element of <SpecificTechnicalDocumentation>.

9.40
<STDRequirements>
This simple element contains a summary of the provisions fulfilled to benefit from the simplifications included in the specific technical documentation.

9.41
<TemplateID>
For products under the CEN route (harmonised standards) this simple element contains the legal reference to the harmonised product standard as listed in the Official Journal of the European Union, including the year and the applicable amendments. For products following the EOTA route a similar approach is recommended.

9.42
<Unit>
This simple element contains the unit in which the declared performance is expressed as defined in the relevant harmonised product standard. The possible content for this element is any unit (e.g. mm, N) or "unitless".

9.43
<UniqueIdentificationCodeProductType>
This simple element contains the unique identification code of the product type defined by the manufacturer according to the regulatory provisions.

9.44
<Value>
This simple element contains the value of the declared performance. The possible content for this element is either a numeric value or a text as defined in the relevant harmonised product standard.

In case it is a numeric value, decimals shall be behind point.

The content of this element is the only one within the element <DeclaredPerformance> that can be changed to reflect the performance declared by the manufacturer.

NOTE The values in Annex A and Annex B are only examples.

9.45
<Website>
This simple element contains the website of the manufacturer or authorised representative (depending on the parent element).

9.46
<ZIP>
This simple element contains the ZIP code of the address of the manufacturer or authorised representative (depending on the parent element).

Annex A
(informative)

Example of Smart CE marking XML document

A.1 Introduction

The following example is an extract of the Smart CE marking XML document created according to EN_771-2:2011+A1:2015 according to the guidelines contained in this document.

A.2 XML document

A.2.1 General information block

The first block of the document is the general information including the XML format information. The parent element for the rest of the declaration is "DeclarationOfPerformance". The identification of the document and DoP (unique identification code of the product type and DoP number), information about the intended use/es, manufacturer, authorised representative, EOTA information, systems of AVCP and notified bodies are children of this parent element.

```
<?xml version="1.0" encoding="UTF-8"?>
<!-- This is Copyrighted © by Construction Products Europe -->
<Declarations xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:noNamespaceSchemaLocation="../xsd/CalciumSilicateMasonryunits.xsd">
    <DeclarationOfPerformance xml:lang="en">
    <TemplateId>EN_771-2:2011+A1:2015</TemplateId>
    <UniqueIdentificationCodeProductType>ABC123</UniqueIdentificationCodeProductType>
    <DoPNumber>ABC123</DoPNumber>
    <IntendedUse>In protected masonry walls, columns and partitions</IntendedUse>
    <Manufacturer>
        <Name>Manufacturer</Name>
        <Address>Bld du Souverain 68</Address>
        <Town>Brussels</Town>
        <ZIP>1170</ZIP>
        <Country>Belgium</Country>
        <Email>info@construction-products.eu</Email>
        <Phone>+32(0)24634957</Phone>
        <Website>https://www.construction-products.eu/</Website>
        <Logo>http://www.construction-products.eu/logo.png</Logo>
    </Manufacturer>
    <AuthorisedRepresentative>
        <Name>Authorized representative</Name>
        <Address>C/ Muro 16</Address>
        <Town>Madrid</Town>
        <ZIP>28080</ZIP>
        <Country>Spain</Country>
        <Email>info@construction-products.eu</Email>
        <Phone>+324977299</Phone>
```

```
        <Website>https://www.construction-products.eu/</Website>
        <Logo>http://www.construction-products.eu/logo.png</Logo>
    </AuthorisedRepresentative>
    <SystemsOfAVCP>
        <AVCP>2+</AVCP>
    </SystemsOfAVCP>
    <HarmonisedStandard>EN 771-2:2011+A1:2015</HarmonisedStandard>
    <EuropeanAssessmentDocument></EuropeanAssessmentDocument>
    <EuropeanTechnicalAssessment></EuropeanTechnicalAssessment>
    <TechnicalAssessmentBody></TechnicalAssessmentBody>
    <NotifiedBodies>
        <NB>
            <NBName>NB1 name</NBName>
            <NBNumber>NB1 number</NBNumber>
        </NB>
    </NotifiedBodies>
```

A.2.2 Declared performance

The second block of the declaration is the declared performance. The structure of the information is the same for all essential characteristics, the elements are generic (see Figure 2 — UML diagram for the declaration of essential characteristics) but their content depend on the harmonised standard provisions, as described in its annex ZA.

A.2.2.1 Dimensions and dimensional tolerances

According to the harmonised standard, the first essential characteristic is dimensions and dimensional tolerances. Dimensions usually are not essential characteristics but they are in this case. In addition to the dimensions of the unit, declaration on tolerances is required. Dimensional toleraces, when declared, can refer to a type or as individual values. The format allows both and, when choosing one, the other is usually empty. In this example the declaration is done according to the type option: Type T1, so the other properties level 2 are empty

```
    <DeclaredPerformance>
        <EssentialCharacteristic>
            <Name>Dimensions and dimensional tolerances</Name>
            <Property>
                <Name>Dimensions</Name>
                <Property>
                    <Name>length</Name>
                    <ReferenceDocument>EN 772-16</ReferenceDocument>
                    <Declaration>
                        <Name>value</Name>
                        <Value>240</Value>
                        <Unit>mm</Unit>
                        <Relation>equal to</Relation>
                    </Declaration>
                </Property>
                <Property>
                    <Name>height</Name>
                    <ReferenceDocument>EN 772-16</ReferenceDocument>
                    <Declaration>
                        <Name>value</Name>
```

```
                <Value>113</Value>
                <Unit>mm</Unit>
                <Relation>equal to</Relation>
            </Declaration>
        </Property>
        <Property>
            <Name>width</Name>
            <ReferenceDocument>EN 772-16</ReferenceDocument>
            <Declaration>
                <Name>value</Name>
                <Value>115</Value>
                <Unit>mm</Unit>
                <Relation>equal to</Relation>
            </Declaration>
        </Property>
        <Property>
            <Name>AVCP</Name>
            <ReferenceDocument> </ReferenceDocument>
            <Declaration>
                <Name>system</Name>
                <Value>2+</Value>
                <Unit>unitless</Unit>
                <Relation>category</Relation>
            </Declaration>
        </Property>
    </Property>
    <Property>
        <Name>Dimensional tolerances</Name>
        <Property>
            <Name>tolerance category</Name>
            <ReferenceDocument>EN 772-1</ReferenceDocument>
            <Declaration>
                <Name>category</Name>
                <Value>T1</Value>
                <Unit>unitless</Unit>
                <Relation>category</Relation>
            </Declaration>
        </Property>
        <Property>
            <Name>mean height of sample</Name>
            <ReferenceDocument>EN 772-16</ReferenceDocument>
            <Declaration>
                <Name>value</Name>
                <Value></Value>
                <Unit>mm</Unit>
                <Relation>plus minus</Relation>
            </Declaration>
        </Property>
        <Property>
            <Name>mean length of sample</Name>
            <ReferenceDocument>EN 772-16</ReferenceDocument>
            <Declaration>
                <Name>value</Name>
```

```
            <Value></Value>
            <Unit>mm</Unit>
            <Relation>plus minus</Relation>
        </Declaration>
    </Property>
    <Property>
        <Name>mean width of sample</Name>
        <ReferenceDocument>EN 772-16</ReferenceDocument>
        <Declaration>
            <Name>value</Name>
            <Value></Value>
            <Unit>mm</Unit>
            <Relation>plus minus</Relation>
        </Declaration>
    </Property>
    <Property>
        <Name>individual height</Name>
        <ReferenceDocument>EN 772-16</ReferenceDocument>
        <Declaration>
            <Name>value</Name>
            <Value></Value>
            <Unit>mm</Unit>
            <Relation>plus minus</Relation>
        </Declaration>
    </Property>
    <Property>
        <Name>individual length</Name>
        <ReferenceDocument>EN 772-16</ReferenceDocument>
        <Declaration>
            <Name>value</Name>
            <Value></Value>
            <Unit>mm</Unit>
            <Relation>plus minus</Relation>
        </Declaration>
    </Property>
    <Property>
        <Name>individual width</Name>
        <ReferenceDocument>EN 772-16</ReferenceDocument>
        <Declaration>
            <Name>value</Name>
            <Value></Value>
            <Unit>mm</Unit>
            <Relation>plus minus</Relation>
        </Declaration>
    </Property>
    <Property>
        <Name>flatness of bed faces</Name>
        <ReferenceDocument>EN 772-20</ReferenceDocument>
        <Declaration>
            <Name>value</Name>
            <Value></Value>
            <Unit>mm</Unit>
            <Relation>less than or equal to</Relation>
```

```
            </Declaration>
        </Property>
        <Property>
            <Name>plane parallelism of bed face</Name>
            <ReferenceDocument>EN 772-16</ReferenceDocument>
            <Declaration>
                <Name>value</Name>
                <Value></Value>
                <Unit>mm</Unit>
                <Relation>less than or equal to</Relation>
            </Declaration>
        </Property>
        <Property>
            <Name>AVCP</Name>
            <ReferenceDocument> </ReferenceDocument>
            <Declaration>
                <Name>system</Name>
                <Value>2+</Value>
                <Unit>unitless</Unit>
                <Relation>category</Relation>
            </Declaration>
        </Property>
    </Property>
</EssentialCharacteristic>
```

A.2.2.2 Configuration

Configuration is a complex essential characteristic because additional properties (percentage of voids, diameter of voids, etc) can be declared but, in general, it is not necessary if the configuration is reported in a diagram available through a link. The structure and content of the additional properties is the same thant the properties showed but they were not included to simplify this example.

```
<EssentialCharacteristic>
    <Name>Configuration</Name>
    <Property>
        <Name>Group according to Eurocodes</Name>
        <Property>
            <Name>group according to eurocodes</Name>
            <ReferenceDocument>EN 1996-1-1</ReferenceDocument>
            <Declaration>
                <Name>group</Name>
                <Value>1</Value>
                <Unit>unitless</Unit>
                <Relation>category</Relation>
            </Declaration>
        </Property>
        <Property>
            <Name>AVCP</Name>
            <ReferenceDocument> </ReferenceDocument>
            <Declaration>
                <Name>system</Name>
                <Value>2+</Value>
                <Unit>unitless</Unit>
```

```
                <Relation>category</Relation>
            </Declaration>
        </Property>
    </Property>
    <Property>
        <Name>Drawing</Name>
        <Property>
            <Name>drawing</Name>
            <ReferenceDocument>EN 771-2</ReferenceDocument>
            <Declaration>
                <Name>file</Name>
                <Value>http://.../diagram.jpg</Value>
                <Unit>unitless</Unit>
                <Relation>file</Relation>
            </Declaration>
        </Property>
        <Property>
            <Name>AVCP</Name>
            <ReferenceDocument> </ReferenceDocument>
            <Declaration>
                <Name>system</Name>
                <Value>2+</Value>
                <Unit>unitless</Unit>
                <Relation>category</Relation>
            </Declaration>
        </Property>
    </Property>
    <Property>
        …
    </Property>
</EssentialCharacteristic>
```

A.2.2.3 Compressive strength

Compressive strength is one of the complex essential characteristics justifying the two level of properties. Most manufacturers declare the performance only for loads perpendicular to bed faces and NPD for the other two directions. For each direction not only the mean and normalised value are reported but also the type of specimen, the category class and the AVCP system.

```
<EssentialCharacteristic>
<Name>Compressive strength</Name>
    <Property>
        <Name>Perpendicular to bed faces</Name>
        <Property>
            <Name>type of specimen</Name>
            <ReferenceDocument>EN 771-2</ReferenceDocument>
            <Declaration>
                <Name>type</Name>
                <Value>whole unit</Value>
                <Unit>unitless</Unit>
                <Relation>category</Relation>
            </Declaration>
        </Property>
```

```
        <Property>
            <Name>category</Name>
            <ReferenceDocument>EN 771-2</ReferenceDocument>
            <Declaration>
                <Name>category</Name>
                <Value>I</Value>
                <Unit>unitless</Unit>
                <Relation>category</Relation>
            </Declaration>
        </Property>
        <Property>
            <Name>mean</Name>
            <ReferenceDocument>EN 772-1</ReferenceDocument>
            <Declaration>
                <Name>value</Name>
                <Value>18.75</Value>
                <Unit>N/mm^2</Unit>
                <Relation>greater than or equal to</Relation>
            </Declaration>
        </Property>
        <Property>
            <Name>normalised</Name>
            <ReferenceDocument>EN 772-1</ReferenceDocument>
            <Declaration>
                <Name>value</Name>
                <Value>15.33</Value>
                <Unit>N/mm^2</Unit>
                <Relation>greater than or equal to</Relation>
            </Declaration>
        </Property>
        <Property>
            <Name>AVCP</Name>
            <ReferenceDocument> </ReferenceDocument>
            <Declaration>
                <Name>system</Name>
                <Value>2+</Value>
                <Unit>unitless</Unit>
                <Relation>category</Relation>
            </Declaration>
        </Property>
    </Property>
    <Property>
        <Name>Perpendicular to header</Name>
        <Property>
            <Name>type of specimen</Name>
            <ReferenceDocument>EN 771-2</ReferenceDocument>
            <Declaration>
                <Name>type</Name>
                <Value></Value>
                <Unit>unitless</Unit>
                <Relation>category</Relation>
            </Declaration>
        </Property>
```

```
        <Property>
            <Name>category</Name>
            <ReferenceDocument>EN 771-2</ReferenceDocument>
            <Declaration>
                <Name>category</Name>
                <Value></Value>
                <Unit>unitless</Unit>
                <Relation>category</Relation>
            </Declaration>
        </Property>
        <Property>
            <Name>mean</Name>
            <ReferenceDocument>EN 772-1</ReferenceDocument>
            <Declaration>
                <Name>value</Name>
                <Value></Value>
                <Unit>N/mm^2</Unit>
                <Relation>greater than or equal to</Relation>
            </Declaration>
        </Property>
        <Property>
            <Name>normalised</Name>
            <ReferenceDocument>EN 772-1</ReferenceDocument>
            <Declaration>
                <Name>value</Name>
                <Value></Value>
                <Unit>N/mm^2</Unit>
                <Relation>greater than or equal to</Relation>
            </Declaration>
        </Property>
        <Property>
            <Name>AVCP</Name>
            <ReferenceDocument> </ReferenceDocument>
            <Declaration>
                <Name>system</Name>
                <Value>2+</Value>
                <Unit>unitless</Unit>
                <Relation>category</Relation>
            </Declaration>
        </Property>
    </Property>
    <Property>
        <Name>Perpendicular to face</Name>
        <Property>
            <Name>type of specimen</Name>
            <ReferenceDocument>EN 771-2</ReferenceDocument>
            <Declaration>
                <Name>type</Name>
                <Value></Value>
                <Unit>unitless</Unit>
                <Relation>category</Relation>
            </Declaration>
        </Property>
```

```
            <Property>
                <Name>category</Name>
                <ReferenceDocument>EN 771-2</ReferenceDocument>
                <Declaration>
                    <Name>category</Name>
                    <Value></Value>
                    <Unit>unitless</Unit>
                    <Relation>category</Relation>
                </Declaration>
            </Property>
            <Property>
                <Name>mean</Name>
                <ReferenceDocument>EN 772-1</ReferenceDocument>
                <Declaration>
                    <Name>value</Name>
                    <Value></Value>
                    <Unit>N/mm^2</Unit>
                    <Relation>greater than or equal to</Relation>
                </Declaration>
            </Property>
            <Property>
                <Name>normalised</Name>
                <ReferenceDocument>EN 772-1</ReferenceDocument>
                <Declaration>
                    <Name>value</Name>
                    <Value>NPD</Value>
                    <Unit>N/mm^2</Unit>
                    <Relation>greater than or equal to</Relation>
                </Declaration>
            </Property>
            <Property>
                <Name>AVCP</Name>
                <ReferenceDocument> </ReferenceDocument>
                <Declaration>
                    <Name>system</Name>
                    <Value>2+</Value>
                    <Unit>unitless</Unit>
                    <Relation>category</Relation>
                </Declaration>
            </Property>
        </Property>
    </EssentialCharacteristic>
```

A.2.2.4 Bond strength

Bond strength is one of the essential characteristics requiring the report of the mortar as additional information. It can be done as generic mortar type but also the specific mortar can be declared. The way to do it is in properties level 2 for the manufacturer name and DoP number. Property level 1 Characteristic initial shear strength can be repeated for each mortar declared, at least one (and could be NPD).

```
    <EssentialCharacteristic>
        <Name>Bond strength </Name>
```

```
<Property>
    <Name>Characteristic initial shear strength</Name>
    <Property>
        <Name>characteristic initial shear strength</Name>
        <ReferenceDocument>EN 1052-3</ReferenceDocument>
        <Declaration>
            <Name>value</Name>
            <Value>0.15</Value>
            <Unit>N/mm^2</Unit>
            <Relation>greater than or equal to</Relation>
        </Declaration>
    </Property>
    <Property>
        <Name>mortar type</Name>
        <ReferenceDocument></ReferenceDocument>
        <Declaration>
            <Name>type</Name>
            <Value>general purpose</Value>
            <Unit>unitless</Unit>
            <Relation>description</Relation>
        </Declaration>
    </Property>
    <Property>
        <Name>mortar manufacturer</Name>
        <ReferenceDocument></ReferenceDocument>
        <Declaration>
            <Name>name</Name>
            <Value>AnyCo</Value>
            <Unit>unitless</Unit>
            <Relation>description</Relation>
        </Declaration>
    </Property>
    <Property>
        <Name>mortar DoP</Name>
        <ReferenceDocument></ReferenceDocument>
        <Declaration>
            <Name>DoP number</Name>
            <Value>ABC-123-2018</Value>
            <Unit>unitless</Unit>
            <Relation>description</Relation>
        </Declaration>
    </Property>
    <Property>
        <Name>AVCP</Name>
        <ReferenceDocument></ReferenceDocument>
        <Declaration>
            <Name>system</Name>
            <Value>2+</Value>
            <Unit>unitless</Unit>
            <Relation>category</Relation>
        </Declaration>
    </Property>
</Property>
```

```
<Property>
    <Name>Characteristic initial shear strength</Name>
    <Property>
        <Name>characteristic initial shear strength</Name>
        <ReferenceDocument>EN 1052-3</ReferenceDocument>
        <Declaration>
            <Name>value</Name>
            <Value>0.12</Value>
            <Unit>N/mm^2</Unit>
            <Relation>greater than or equal to</Relation>
        </Declaration>
    </Property>
    <Property>
        <Name>mortar type</Name>
        <ReferenceDocument></ReferenceDocument>
        <Declaration>
            <Name>type</Name>
            <Value>lightweight</Value>
            <Unit>unitless</Unit>
            <Relation>description</Relation>
        </Declaration>
    </Property>
    <Property>
        <Name>mortar manufacturer</Name>
        <ReferenceDocument></ReferenceDocument>
        <Declaration>
            <Name>name</Name>
            <Value>AnyCo</Value>
            <Unit>unitless</Unit>
            <Relation>description</Relation>
        </Declaration>
    </Property>
    <Property>
        <Name>mortar DoP</Name>
        <ReferenceDocument></ReferenceDocument>
        <Declaration>
            <Name>DoP number</Name>
            <Value>ABC-321-2018</Value>
            <Unit>unitless</Unit>
            <Relation>description</Relation>
        </Declaration>
    </Property>
    <Property>
        <Name>AVCP</Name>
        <ReferenceDocument></ReferenceDocument>
        <Declaration>
            <Name>system</Name>
            <Value>2+</Value>
            <Unit>unitless</Unit>
            <Relation>category</Relation>
        </Declaration>
    </Property>
</Property>
```

```
</EssentialCharacteristic>
```

A.2.2.5 Reaction to fire

Reaction to fire is one of the most common essential characteristics. As it is a single declaration, it only contains one property level 1 and two properties level 2 (declaration and AVCP system). It is one of the simplest declarations.

```
<EssentialCharacteristic>
    <Name>Reaction to fire</Name>
    <Property>
        <Name>Reaction to fire</Name>
        <Property>
            <Name>reaction to fire</Name>
            <ReferenceDocument>Commission Decision
2000/605/EC</ReferenceDocument>
            <Declaration>
                <Name>class</Name>
                <Value>A1</Value>
                <Unit>unitless</Unit>
                <Relation>class</Relation>
            </Declaration>
        </Property>
        <Property>
            <Name>AVCP</Name>
            <ReferenceDocument></ReferenceDocument>
            <Declaration>
                <Name>system</Name>
                <Value>2+</Value>
                <Unit>unitless</Unit>
                <Relation>category</Relation>
            </Declaration>
        </Property>
    </Property>
</EssentialCharacteristic>
```

A.2.2.6 Water absorption

Water absorption is also a simple declaration according to a defined test method.

```
<EssentialCharacteristic>
    <Name>Water absorption</Name>
    <Property>
        <Name>Water absorption</Name>
        <Property>
            <Name>water absorption</Name>
            <ReferenceDocument>EN 772-21</ReferenceDocument>
            <Declaration>
                <Name>value</Name>
                <Value>NPD</Value>
                <Unit>%</Unit>
                <Relation>less than or equal to</Relation>
            </Declaration>
        </Property>
```

```
            <Property>
                <Name>AVCP</Name>
                <ReferenceDocument></ReferenceDocument>
                <Declaration>
                    <Name>system</Name>
                    <Value>2+</Value>
                    <Unit>unitless</Unit>
                    <Relation>category</Relation>
                </Declaration>
            </Property>
        </Property>
    </EssentialCharacteristic>
```

A.2.2.7 Water vapour permeability

Water vapour permeability is related to the intended use but shall be included as NPD or with the declared performance.

```
    <EssentialCharacteristic>
        <Name>Water vapour permeability</Name>
        <Property>
            <Name>Water vapour permeability</Name>
            <Property>
                <Name>water vapour diffusion coefficient (μ)</Name>
                <ReferenceDocument>EN 1745</ReferenceDocument>
                <Declaration>
                    <Name>value</Name>
                    <Value>NPD</Value>
                    <Unit>unitless</Unit>
                    <Relation>equal to</Relation>
                </Declaration>
            </Property>
            <Property>
                <Name>AVCP</Name>
                <ReferenceDocument></ReferenceDocument>
                <Declaration>
                    <Name>system</Name>
                    <Value>2+</Value>
                    <Unit>unitless</Unit>
                    <Relation>category</Relation>
                </Declaration>
            </Property>
        </Property>
    </EssentialCharacteristic>
```

A.2.2.8 Direct airborne sound insulation

Direct airborne sound insulation is declared through a density as proxy characteristic and, as it is a range, both minimum and maximum values are reported.

```
    <EssentialCharacteristic>
        <Name>Direct airborne sound insulation</Name>
        <Property>
            <Name>Gross dry density</Name>
```

```
            <Property>
                <Name>minimum mean gross dry density</Name>
                <ReferenceDocument>EN 772-13</ReferenceDocument>
                <Declaration>
                    <Name>value</Name>
                    <Value>1410</Value>
                    <Unit>kg/m^3</Unit>
                    <Relation>greater than or equal to</Relation>
                </Declaration>
            </Property>
            <Property>
                <Name>maximum mean gross dry density</Name>
                <ReferenceDocument>EN 772-13</ReferenceDocument>
                <Declaration>
                    <Name>value</Name>
                    <Value>1600</Value>
                    <Unit>kg/m^3</Unit>
                    <Relation>less than or equal to</Relation>
                </Declaration>
            </Property>
            <Property>
                <Name>AVCP</Name>
                <ReferenceDocument></ReferenceDocument>
                <Declaration>
                    <Name>system</Name>
                    <Value>2+</Value>
                    <Unit>unitless</Unit>
                    <Relation>category</Relation>
                </Declaration>
            </Property>
        </Property>
    </EssentialCharacteristic>
```

A.2.2.9 Thermal resistance

Thermal resistance could be declared according to a statistical analysis, therefore additional parameters fractile and confidence level. This approach is very flexible but requires a complete set of properties level 2.

```
    <EssentialCharacteristic>
        <Name>Thermal resistance</Name>
        <Property>
            <Name>Thermal conductivity</Name>
            <Property>
                <Name>mean thermal conductivity</Name>
                <ReferenceDocument>EN 1745</ReferenceDocument>
                <Declaration>
                    <Name>value</Name>
                    <Value>NPD</Value>
                    <Unit>W/m·K</Unit>
                    <Relation>less than or equal to</Relation>
                </Declaration>
            </Property>
```

```
        <Property>
            <Name>Determination model</Name>
            <ReferenceDocument>EN 1745</ReferenceDocument>
            <Declaration>
                <Name>method</Name>
                <Value>S2</Value>
                <Unit>unitless</Unit>
                <Relation>class</Relation>
            </Declaration>
        </Property>
        <Property>
            <Name>AVCP</Name>
            <ReferenceDocument></ReferenceDocument>
            <Declaration>
                <Name>system</Name>
                <Value>2+</Value>
                <Unit>unitless</Unit>
                <Relation>category</Relation>
            </Declaration>
        </Property>
    </Property>
    <Property>
        <Name>Thermal conductivity (λ[sub]10, dry, unit (X/Y)[/sub])</Name>
        <Property>
            <Name>thermal conductivity</Name>
            <ReferenceDocument>EN 1745</ReferenceDocument>
            <Declaration>
                <Name>value</Name>
                <Value></Value>
                <Unit>W/m·K</Unit>
                <Relation>less than or equal to</Relation>
            </Declaration>
        </Property>
        <Property>
            <Name>fractile X</Name>
            <ReferenceDocument>EN 1745</ReferenceDocument>
            <Declaration>
                <Name>value</Name>
                <Value></Value>
                <Unit>%</Unit>
                <Relation>equal to</Relation>
            </Declaration>
        </Property>
        <Property>
            <Name> confidence level Y </Name>
            <ReferenceDocument>EN 1745</ReferenceDocument>
            <Declaration>
                <Name>value</Name>
                <Value></Value>
                <Unit>%</Unit>
                <Relation>equal to</Relation>
            </Declaration>
        </Property>
```

```
            <Property>
                <Name>AVCP</Name>
                <ReferenceDocument></ReferenceDocument>
                <Declaration>
                    <Name>system</Name>
                    <Value>2+</Value>
                    <Unit>unitless</Unit>
                    <Relation>category</Relation>
                </Declaration>
            </Property>
        </Property>
    </EssentialCharacteristic>
```

A.2.2.10 Durability against freeze/thaw

Durability against freeze/thaw is only relevant for some intended uses but its declaration is possible according to the relevant test method.

```
    <EssentialCharacteristic>
        <Name>Durability against freeze/thaw</Name>
        <Property>
            <Name>Freeze-thaw resistance</Name>
            <Property>
                <Name>Freeze-thaw resistance category</Name>
                <ReferenceDocument>EN 772-18</ReferenceDocument>
                <Declaration>
                    <Name>category</Name>
                    <Value>F1</Value>
                    <Unit>unitless</Unit>
                    <Relation>class</Relation>
                </Declaration>
            </Property>
            <Property>
                <Name>AVCP</Name>
                <ReferenceDocument></ReferenceDocument>
                <Declaration>
                    <Name>system</Name>
                    <Value>2+</Value>
                    <Unit>unitless</Unit>
                    <Relation>category</Relation>
                </Declaration>
            </Property>
        </Property>
    </EssentialCharacteristic>
```

A.2.2.11 Release of dangerous substances

The rules for the declaration of this essential characteristic are not fully developed so a generic proposal is included.

```
    <EssentialCharacteristic>
        <Name>Dangerous substances</Name>
        <Property>
            <Name>Dangerous substances</Name>
```

```
            <Property>
                <Name>Dangerous substances</Name>
                <ReferenceDocument></ReferenceDocument>
                <Declaration>
                    <Name>dangerous substances</Name>
                    <Value>NPD</Value>
                    <Unit></Unit>
                    <Relation></Relation>
                </Declaration>
            </Property>
            <Property>
                <Name>AVCP</Name>
                <ReferenceDocument></ReferenceDocument>
                <Declaration>
                    <Name>system</Name>
                    <Value>2+</Value>
                    <Unit>unitless</Unit>
                    <Relation>category</Relation>
                </Declaration>
            </Property>
        </Property>
    </EssentialCharacteristic>
</DeclaredPerformance >
```

A.2.3 Appropriate and Specific Technical Documentation

Manufacturers are free to choose the way they report this information. As a general guidance the reference to the internal documents relevant to these points and the conditions fulfilled are included.

```
<AppropriateTechnicalDocumentation>
    <ATD>
        <ATDReferenceNumber></ATDReferenceNumber >
        <ATDRequirements></ATDRequirements >
    </ATD>
</AppropriateTechnicalDocumentation>
<SpecificTechnicalDocumentation>
    <STD>
        <STDReferenceNumber></STDReferenceNumber >
        <STDRequirements></STDRequirements >
    </STD>
</SpecificTechnicalDocumentation>
```

A.2.4 Signature

Name, place, date and signature are required.

```
<Statement>The performance of the product identified above is in conformity with the set of declared performance/s. This declaration of performance is issued, in accordance with Regulation (EU) No 305/2011, under the sole responsibility of the manufacturer identified above. </Statement>
<Name></Name>
<Place></Place>
<Date></Date>
<Signature></Signature>
```

A.2.5 Additional information related to the DoP

DoP is accompanied by some documents. As it is delivered in XML format, the links to them should be also included.

```
    <InstructionsAndSafetyInformation>
        <Link></Link>
    </InstructionsAndSafetyInformation>
    <REACHInformation>
        <Link></Link>
    </REACHInformation>
        <DoPLink></DoPLink>
</DeclarationOfPerformance>
</Declarations>
```

Annex B
(informative)

Example of table of essential characteristics

Figure B.1 — Essential characteristics estructure diagram show the structure of the information.

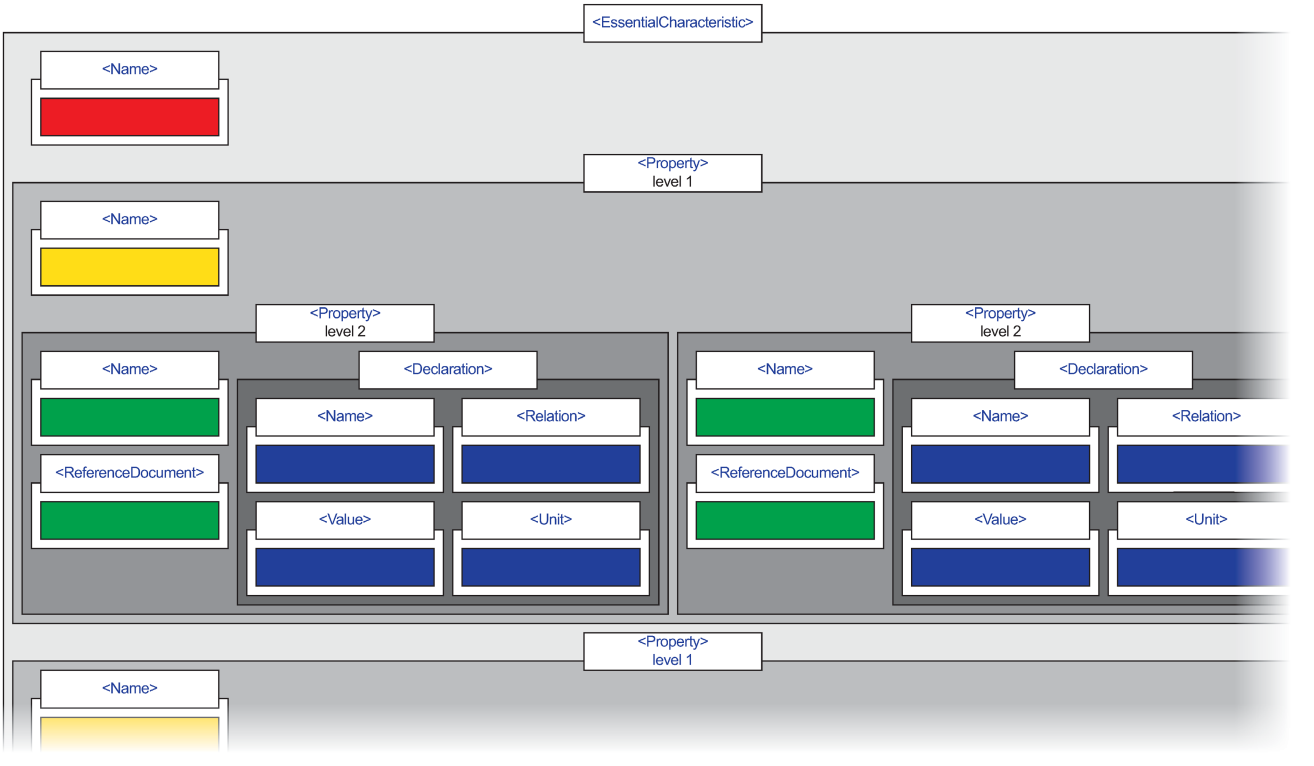

Figure B.1 — Essential characteristics estructure diagram

Table B.1 — Essential characteristics and related properties and values contains the content of the elements for the example in Annex A, colors correlate the information in the structure and in the table.

Table B.1 — Essential characteristics and related properties and values

Essential characteristic <Name>	Property (level 1) <Name>	Property (level 2) <Name>	<Reference Document>	Declaration <Name>	<Value>[1]	<Unit>	<Relation>
Dimensions and dimensional tolerances	Dimensions	length	EN 772-16	value	240	mm	equal to
		height	EN 772-16	value	113	mm	equal to
		width	EN 772-16	value	115	mm	equal to
		AVCP		system	2+	unitless	category
	Dimensional tolerances	tolerance category	EN 772-1	category	T1	unitless	category
		mean height of sample	EN 772-16	value		mm	plus minus
		mean length of sample	EN 772-16	value		mm	plus minus
		mean width of sample	EN 772-16	value		mm	plus minus
		individual height	EN 772-16	value		mm	plus minus
		individual length	EN 772-16	value		mm	plus minus
		individual width	EN 772-16	value		mm	plus minus
		flatness of bed faces	EN 772-20	value		mm	less than or equal to
		plane parallelism of bed faces	EN 772-20	value		mm	less than or equal to
		AVCP		system	2+	unitless	category
Configuration	Group according to Eurocodes	group according to eurocodes	EN 1996-1-1	group	1	unitless	category
		AVCP		system	2+	unitless	category
	Drawing	drawing	EN 771-2	file	http://.../diagram.jpg	unitless	file
		AVCP		system	2+	unitless	category
	Description	...	...	...	...	...	...
		...	...	...	...	...	...
Compressive strength	Perpendicular to bed faces	type of specimen	EN 771-2	type	whole unit	unitless	category
		category	EN 771-2	category	I	unitless	category
		mean	EN 772-1	value	18.75	N/mm^2	greater than or equal to
		normalised	EN 772-1	value	15.33	N/mm^2	greater than or equal to
		AVCP		system	2+	unitless	category

[1] Values in this column (shaded) are examples.

Essential characteristic <Name>	Property (level 1) <Name>	Property (level 2) <Name>	<Reference Document>	Declaration <Name>	<Value>[1]	<Unit>	<Relation>
	Perpendicular to header	type of specimen	EN 771-2	type		unitless	category
		category	EN 771-2	category		unitless	category
		mean	EN 772-1	value		N/mm^2	greater than or equal to
		normalised	EN 772-1	value		N/mm^2	greater than or equal to
		AVCP		system	2+	unitless	category
	Perpendicular to bed	type of specimen	EN 771-2	type		unitless	category
		category	EN 771-2	category		unitless	category
		mean	EN 772-1	value		N/mm^2	greater than or equal to
		normalised	EN 772-1	value		N/mm^2	greater than or equal to
		AVCP		system	2+	unitless	category
Bond strength	Characteristic initial shear strength	characteristic initial shear strength	EN 1052-3	value	0.15	N/mm^2	greater than or equal to
		mortar type		type	General purpose	unitless	description
		mortar manufacturer		name	AnyCo	unitless	description
		mortar dop		dop number	ABC-123-2018	unitless	description
		AVCP		system	2+	unitless	category
	Characteristic initial shear strength	characteristic initial shear strength	EN 1052-3	value	0.12	N/mm^2	greater than or equal to
		mortar type		type	Lightweight	unitless	description
		mortar manufacturer		name	AnyCo	unitless	description
		mortar dop		dop number	ABC-123-2018	unitless	description
		AVCP		system	2+	unitless	category
Reaction to fire	Reaction to fire	reaction to fire	Commission Decision 2000/605/EC	class	A1	unitless	class
		AVCP		system	2+	unitless	category
Water absorption	Water absorption	water absorption	EN 772-21	value	NPD	%	less than or equal
		AVCP		system	2+	unitless	category
Water vapour permeability	Water vapour permeability	water vapour diffusion coefficient (μ)	EN 1745	value	NPD	unitless	equal to
		AVCP		system	2+	unitless	category

Essential characteristic <Name>	Property (level 1) <Name>	Property (level 2) <Name>	<Reference Document>	Declaration <Name>	<Value>[1]	<Unit>	<Relation>
Direct airborne sound insulation	Gross dry density	minimum mean gross dry density	EN 772-13	value	1410	Kg/m^3	greater than or equal to
		maximum mean gross dry density	EN 772-13	value	1600	Kg/m^3	less than or equal to
		AVCP		system	2+	unitless	category
Thermal resistance	Thermal conductivity	mean thermal conductivity	EN 1745	value	NPD	W/m·K	less than or equal to
		determination model	EN 1745	method	S2	unitless	category
		AVCP		system	2+	unitless	category
	Thermal conductivity (λ[sub]10, dry, unit (X/Y)[/sub])	thermal conductivity	EN 1745	value		W/m·K	less than or equal to
		fractile x	EN 1745	value		%	equal to
		confidence level y	EN 1745	value		%	equal to
		AVCP		system	2+	unitless	category
Durability against freeze/thaw	Freeze-thaw resistance	freeze-thaw resistance category	EN 772-18	category	F1	unitless	category
		AVCP		system	2+	unitless	category
Dangerous substances	Dangerous substances	dangerous substances		dangerous substances	NPD		
		AVCP		system	2+	unitless	category

Bibliography

[1] Regulation (EU) No 305/2011 of the European Parliament and of the Council laying down harmonised conditions for the marketing of construction products and repealing Council Directive 89/106/EEC

[2] Commission Delegated Regulation (EU) No 157/2014 of 30 October 2013 on the conditions for making a declaration of performance on construction products available on a website

[3] Commission Delegated Regulation (EU) No 574/2014 of 21 February 2014 amending Annex III to Regulation (EU) No 305/2011 on the model to be used for drawing up a declaration of performance on construction products

[4] Commission Delegated Regulation (EU) No 568/2014 of 18 February 2014 amending Annex V to Regulation (EU) No 305/2011 of the European Parliament and of the Council as regards the assessment and verification of constancy of performance of construction products

[5] ISO/IEC 19505-1:2012 Information technology -- Object Management Group Unified Modelling Language (OMG UML) -- Part 1: Infrastructure