
**Geographic information —
Metadata —**

**Part 3:
XML schema implementation for
fundamental concepts**

*Information géographique — Métadonnées —
Partie 3: Mise en œuvre par des schémas XML*



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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

ISO draws attention to the possibility that the implementation of this document may involve the use of (a) patent(s). ISO takes no position concerning the evidence, validity or applicability of any claimed patent rights in respect thereof. As of the date of publication of this document, ISO had not received notice of (a) patent(s) which may be required to implement this document. However, implementers are cautioned that this may not represent the latest information, which may be obtained from the patent database available at www.iso.org/patents. ISO shall not be held responsible for identifying any or all such patent rights.

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 211, *Geographic information/Geomatics*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 287, *Geographic Information*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This first edition cancels and replaces the first edition (ISO/TS 19115-3:2016), which has been technically revised.

The main changes are as follows:

- cross-references to other documents have been updated; in particular, ISO 19139:2007 has been updated to ISO/TS 19139-1:2019;
- components have been reallocated to the relevant primary International Standards, notably ISO 19115-1:2014, ISO 19115-2:2019 and ISO 19103:2015;
- additional packages and namespaces derived by the aggregation of packages defined in ISO 19115-1:2014 and ISO 19115-2:2009¹⁾ have been removed;
- tables have been consolidated in order to reduce repetition of information and to collocate information concerning requirements, conformance tests and the clauses to which they refer;
- elements in the XML schemas for ISO 19115-1:2014 and ISO 19115-2:2019 have been reordered in order to align with the order of attributes in the associated data dictionaries. Appropriate XML stylesheets (XSLT) have been generated to assist in the transformation of XML records from records conforming to previous versions of the schemas. The conceptual models in the HMMG have been

1) Cancelled and replaced by ISO 19115-2:2019.

augmented to include the attribute ordering as set out in the data dictionaries in ISO 19115-1:2014 plus ISO 19115-1:2014/Amd 1:2018 and ISO 19115-1:2014/Amd 2:2020 and ISO 19115-2:2019.

A list of all parts in the ISO 19115 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

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Introduction

0.1 Metadata models for geographic information resources

ISO 19115-1 and ISO 19115-2 collectively provide conceptual models that describe geographic information resources. These models represent metadata of geographic information resources.

ISO 19115-1 explains the importance of metadata, specifies a model for describing geographic information resources by defining metadata entities, elements and terminology, and establishing an extension procedure for additional metadata content. It also incorporates metadata elements describing web services defined in ISO 19119:2005²⁾ and ISO 19119:2005/Amd 1:2008³⁾, where those elements are no longer included in ISO 19119:2016 as they have been supplanted by more detailed metadata elements for geographic data types and data quality defined in other ISO geographic information standards (e.g. ISO 19110:2016 and ISO 19157:2013).

NOTE ISO 19115-1:2014, Annex G describes the revisions from ISO 19115:2003⁴⁾.

ISO 19115-2 extends ISO 19115-1 by adding models for acquisition information and extending the models for metadata (MD_Metadata), data quality (DQ_DataQuality, now in ISO 19157:2013), spatial representation (MD_SpatialRepresentation), and content information (MD_ContentInformation).

0.2 XML encoding of metadata models

As ISO 19115-1 and ISO 19115-2 define conceptual models for metadata content, these models are independent of any particular encoding scheme. To use these models in XML requires the development of an XML encoding that implements the conceptual models.

In the past, ISO 19115:2003, the predecessor of ISO 19115-1 and ISO 19115-2, has been provided with an XML encoding defined by ISO/TS 19139:2007⁵⁾ and ISO/TS 19139-2:2012⁶⁾, called “gmd”.

With the advent of ISO 19115-1 and ISO 19115-2, a new XML encoding is needed. This document fulfils that role by providing integrated XML schemas for ISO 19115-1 and ISO 19115-2 metadata content, effectively replacing ISO/TS 19139:2007 and ISO/TS 19139-2:2012.

0.3 Integrated schemas

The integrated schemas provided by this document make it possible to use concepts from ISO 19115-1:2014 and ISO 19115-2:2019 together in metadata instance documents, and enable automated validation and interchange of metadata content using standard software tools.

The integrated schemas have been derived from ISO 19115-1 and ISO 19115-2 conceptual models using the rules defined in ISO/TS 19139-1:2019 applied to an adapted implementation-ready UML version of the conceptual models as described in [Clause 10](#). The implementation approach enables modularization and eases reuse of elements of the conceptual models.

Abstract classes were added to the ISO geographic information harmonized model, without altering the semantics, to create an implementation model that was used for this XML implementation (see [Clause 10](#) for details).

0.4 Intent and usage

The primary use case envisioned for this XML implementation is the exchange of geographic metadata in a client-server environment exemplified by the World Wide Web, in which the internal management

2) Cancelled and replaced by ISO 19119:2016.

3) Cancelled and replaced by ISO 19119:2016.

4) Cancelled and replaced by ISO 19115-1:2014.

5) Cancelled and replaced by ISO/TS 19139-1:2019.

6) Withdrawn.

and structure of metadata content is independent of the encoding used for the exchange of metadata information.

Adoption of this geographic metadata XML schema within an information-sharing community will garner the benefits of standardization for resource discovery, access, use and understanding.

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Geographic information — Metadata —

Part 3: XML schema implementation for fundamental concepts

1 Scope

This document defines an integrated XML implementation of ISO 19115-1 and ISO 19115-2 by defining the following artefacts:

- a set of XML schema required to validate metadata instance documents conforming to conceptual model elements defined in ISO 19115-1 and ISO 19115-2; and
- a set of ISO/IEC 19757-3 (Schematron) rules that implement validation constraints in the ISO 19115-1 and ISO 19115-2 UML models that are not validated by the XML schema.

This document describes the procedure used to generate XML schemas from ISO geographic information conceptual models related to metadata. The XML schemas are generated directly from the conceptual UML model (8.5).

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 19103:2015, *Geographic information — Conceptual schema language*

ISO 19110:2016, *Geographic information — Methodology for feature cataloguing*

ISO 19115-1:2014, *Geographic information — Metadata — Part 1: Fundamentals*

ISO 19115-1:2014/Amd 1:2018, *Geographic information — Metadata — Part 1: Fundamentals — Amendment 1*

ISO 19115-1:2014/Amd 2:2020, *Geographic information — Metadata — Part 1: Fundamentals — Amendment 2*

ISO 19115-2:2019, *Geographic information — Metadata — Part 2: Extensions for acquisition and processing*

ISO 19136-1:2020, *Geographic information — Geography Markup Language (GML) — Part 1: Fundamentals*

ISO/TS 19139-1:2019, *Geographic information — XML schema implementation — Part 1: Encoding rules*

3 Terms, definitions and abbreviated terms

3.1 Terms and definitions

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

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>

— IEC Electropedia: available at <https://www.electropedia.org/>

3.1.1

namespace

<XML> collection of names, identified by a URI reference, which are used in XML documents as element names and attribute names

Note 1 to entry: The combination of a namespace URI and element or attribute name are intended to be a globally unique identifier for that model element.

Note 2 to entry: See Reference [18].

3.1.2

package

<UML> general purpose mechanism for organizing elements into groups

EXAMPLE Identification information package, metadata entity set information package, constraint information package.

Note 1 to entry: Packages may be nested within other packages. Both model elements and diagrams may appear in a package.

Note 2 to entry: A package provides a *namespace* (3.1.1) for the grouped elements.

[SOURCE: ISO 19103:2015, 4.27, modified — Examples and notes to entry have been added.]

3.1.3

polymorphism

capability of expression in alternative forms that also allows extensions to semantics, structure and behaviour

Note 1 to entry: Polymorphism is commonly applied to data in order to support different usages and contexts.

3.2 Abbreviated terms

GML	Geography Markup Language
HTML	HyperText Markup Language
MA	maintenance agency
UML	Unified Modeling Language
URI	Uniform Resource Identifier
URL	Uniform Resource Locator
XML	Extensible Markup Language
XPath	XML Path Language
XSD	XML Schema Definition
XSL	Extensible Style Language
XSLT	Extensible Stylesheet Language Transformation

4 Conventions

4.1 Availability of ISO/TC 211 resources

4.1.1 Maintenance agency for ISO/TC 211 resources

ISO/TC 211 harmonized resources are resources published by ISO/TC 211 with the intention of assisting developers, implementers and users of ISO/TC 211 standards, including UML models, XML schemas and ontologies.

Such resources, including those provided by this document, are managed by a maintenance agency. The name and contact information of the maintenance agency for this document can be found at www.iso.org/maintenance_agencies.

4.1.2 Resources provided by this document

This document provides the following types of ISO/TC 211 harmonized resources:

- XML schemas;
- normative statement classes and normative statements;
- conformance class and tests.

4.2 Presentation of ISO/TC 211 resources

4.2.1 General

Conformance to ISO/TC 211 documents depends on the satisfaction of all mandatory provision classes and conformance classes provided in the document.

This clause describes how these information resources are presented in this document.

4.2.2 Provision classes and provisions

Provision classes are collections of provisions grouped together according to a common theme or a coherent need, such as for the implementation of a particular feature.

Provision classes can be mandatory or optional if explicitly specified.

A provision class is rendered as shown in [Table 1](#).

NOTE The title of a table denotes the number and title of the provision class, for example: Requirements class 1: Metadata core (ISO 19115-1).

Table 1 — Example 1: Requirement class X: Example title

Identifier	<i>The ISO/TC 211 URI of the provision class.</i>
Implements	<i>Any provision class that this provision is an implementation of.</i>
Target type	<i>Type of subject of which the provision class applies.</i>
Prerequisites	<i>List of provision classes that this provision class depends on.</i>
Included in	<i>List of provision classes that this provision class is included in.</i>
Provisions	<i>List of provisions contained in this provision class.</i>
Description	<i>The description of the provision class.</i>
Guidance	<i>Informative information provided as guidance for implementation.</i>

Provisions are statements that describe conformance conditions for this document.

The following types of provision are specified in ISO/TC 211 documents:

- Requirement: conformance to the statement is mandatory;
- Recommendation: conformance to the statement is recommended;
- Permission: conformance to the statement is permitted.

A provision is rendered as shown in [Table 2](#).

NOTE The table title denotes the number and title of the provision, for example: Requirement 104: Character set code from IANA charset register.

Table 2 — Example 2: Requirement X: Example title

Identifier	<i>The ISO/TC 211 URI of the provision.</i>
Target type	<i>Type of subject for which the provision applies.</i>
Implements	<i>Any provision of which this provision is an implementation.</i>
Prerequisites	<i>List of provisions on which this provision depends.</i>
Included in	<i>List of provision classes in which this provision is included.</i>
Statement	<i>The statement to be satisfied.</i>
Guidance	<i>Informative information provided as guidance for implementation.</i>

4.2.3 Conformance classes and conformance tests

Satisfaction of ISO/TC 211 provision classes and provisions is determined by the validation of corresponding conformance classes and conformance tests.

A conformance class contains at least one conformance test that validates a target meeting all provisions described in a provision class.

A conformance class is rendered as shown in [Table 3](#).

NOTE The table title denotes the number and title of the conformance class, for example: Conformance class A.1: Metadata core (ISO 19115-1).

Table 3 — Example 3: Conformance class X: Example title

Identifier	<i>The ISO/TC 211 URI of the conformance class.</i>
Target type	<i>Type of subject for which the conformance class applies.</i>
Satisfies	<i>List of requirements classes that this conformance class satisfies.</i>
Prerequisites	<i>List of conformance classes on which this conformance class depends..</i>
Included in	<i>List of conformance classes in which this conformance class is included.</i>
Includes	<i>List of conformance tests contained in this conformance class.</i>
Description	<i>The description of the conformance class.</i>
Guidance	<i>Informative information provided as guidance for testing.</i>

A conformance test provides test methods that validate a target meeting at least one provision.

A conformance test is rendered as shown in [Table 4](#).

NOTE The table title denotes the number and title of the conformance test for example: Conformance test A.25: Valid root class of the metadata minimal instance.

Table 4 — Example 4: Conformance test X: Example title

Identifier	<i>The ISO/TC 211 URI of the conformance test.</i>
Target type	<i>Type of subject for which the conformance test applies.</i>
Satisfies	<i>List of requirements that this conformance test satisfies.</i>
Prerequisites	<i>List of conformance tests on which this conformance test depends.</i>
Included in	<i>List of conformance classes in which this conformance test is included.</i>
Test purpose	<i>The purpose of this conformance test.</i>
Test method	<i>The method and steps for executing this conformance test.</i>
Test type	(Optional) <i>The type of conformance test.</i>
Guidance	<i>Informative information provided as guidance for testing.</i>

4.3 Structure of URIs in ISO/TC 211 resources for implementation

4.3.1 General

The implementation of ISO/TC 211 documents requires the provision of access to official and unique identification of resources provided by those documents.

ISO/TC 211 defines a set of rules for constructing URIs to be used in all documents published by ISO/TC 211. These rules are approved documented in Reference [28].

4.3.2 Identified resources

The following types of resources provided in this document are assigned unique and persistent identifiers:

- XML schemas (Reference [28], described in 4.3.4)
- normative statement classes and normative statements (Reference [28], described in 4.3.5)
- conformance class and tests (Reference [28], described in 4.3.6)

The relevant URI structures are reproduced in the following subclauses for reference.

4.3.3 Basic elements used in URI templates

Elements used in URI templates include:

<code>standardNumber</code>	The main document number of the International Standard. EXAMPLE 1 19115 for a document in the ISO 19115 series.
<code>partNumber</code>	For a series with several parts. If there are no additional parts, the string - is used. EXAMPLE 2 -3 for part 3.
<code>editionNumber</code>	Official ISO edition number. EXAMPLE 3 1 for edition 1.

4.3.4 XML schema namespace and location

URI template for XML namespace:

- `https://schemas.isotc211.org/standardNumber/-[partNumber]/namespace/editionNumber.majorSchemaReleaseNo`

URL template for XML schema location:

— `https://schemas.isotc211.org/standardNumber/-[partNumber]/namespace/editionNumber.
majorSchemaReleaseNo.minorSchemaRevisionNo/namespace.xsd`

where:

<code>namespace</code>	is the XML namespace prefix for the schema; EXAMPLE 1 <code>mda</code> for the XML namespace for metadata application.
<code>majorSchemaReleaseNo</code>	is the major schema release number of the schema, which changes if a new a namespace is used;
<code>minorSchemaRevisionNo</code>	is the minor schema revision number of the schema, which is added to the schema location to enable minor fixes while keeping the namespace stable.

NOTE 1 Refer to [4.3.3](#) for an explanation of the basic elements in the URI template.

NOTE 2 The edition number is appended to the end of the template to facilitate upgrading in implementations.

EXAMPLE 2 The namespace prefix and schema location for the `mcc` namespace of ISO 19115-1, edition 1, major schema release number 3, minor schema revision number 0 is represented by:

— namespace `https://schemas.isotc211.org/19115/-1/mcc/1.3`
— schema location `https://schemas.isotc211.org/19115/-1/mcc/1.3.0/mcc.xsd`

Dereferencing the namespace URI as a resource locator (as a URL) will retrieve a description of the namespace, links to description of the content of the namespace and links to the base specification the namespace implements and to the normative XML schema location.

As the full URI is cumbersome for reading, writing, and in human discussion, the common prefix of the URI is typically omitted. However, since this document involves URIs spanning multiple documents, the usage of the full URI for clarity is preferred when used in this document.

4.3.5 Normative statements

URI template for normative statement class:

— `https://standards.isotc211.org/standardNumber/-[partNumber]/editionNumber/
statementType/nsClassId`

URI template for normative statement:

— `https://standards.isotc211.org/standardNumber/-[partNumber]/editionNumber/
statementType/nsClassId/nsId`

where:

<code>statementType</code>	is the type of the normative statement, which is one of <code>req</code> (requirement), <code>rec</code> (recommendation) or <code>per</code> (permission);
<code>nsClassId</code>	is the internal identifier of the normative statement class;
<code>nsID</code>	is the internal identifier for the normative statement within the normative statement class.

NOTE 1 Refer to [4.3.3](#) for an explanation of the basic elements in the URI template.

NOTE 2 The edition number of the document is placed before the statement type to enable there to be one main URI for all statements in one edition. The statements are expected to require inspection for each edition.

EXAMPLE The URI for requirement extent in the requirement class content in ISO 19131 (edition 2) is identified by the URI:

— `https://standards.isotc211.org/19131/-/2/req/content/extent`

4.3.6 Conformance classes and tests

URI template for conformance class:

— `https://standards.isotc211.org/standardNumber/-[partNumber]/editionNumber/conf/classId`

URI template for conformance test:

— `https://standards.isotc211.org/standardNumber/-[partNumber]/editionNumber/conf/classId/TestId`

where:

`classId` is the internal identifier of the conformance class;

`testId` is the internal identifier for the conformance test within the conformance class.

NOTE 1 Refer to [4.3.3](#) for an explanation of the basic elements in the URI template.

NOTE 2 The edition number of the document is placed before "conf" to enable there to be one main URI for all conformance classes in one edition. The tests are expected to require inspection for each edition.

EXAMPLE The URI for the conformance test allContent in the conformance class content in ISO 19131 (edition 2) is identified by the URI:

— `https://standards.isotc211.org/19131/-/2/conf/content/allContent`

4.4 Presentation of information resources in this document

4.4.1 General

This document provides descriptions of multiple types of information resources from different sources, including:

- normative statement classes and conformance classes that link to UML models described in ISO 19115-1 and ISO 19115-2;
- XML schemas that implement the UML models described in ISO 19115-1 and ISO 19115-2, as well as ISO 19103:2015 and ISO 19136-1:2020;
- normative statement classes and conformance classes that apply to the XML schemas described in this document;
- machine-executable supporting resources that implement the conformance tests that apply to the XML schemas described in this document.

The following subclauses describe how these information resources relate to each other as provided in this document.

4.4.2 Relations between information resources

The types of information resources provided in this document and their relationships are described in [Figure 1](#).

In particular, there are two planes of concerns shown in [Figure 1](#):

- UML plane, which contains UML models, and their normative statement classes (with requirements) and conformance classes (with conformance tests); and
- XML plane, which contains XML schemas, and their normative statement classes (with requirements) and conformance classes (with conformance tests).

In this document:

- UML is considered as a platform-independent modelling mechanism, where it defines abstract information models (potentially with constraint information) without regard for platform-specific concerns. The UML plane represents conceptual concerns on information structure and relationships.
- XML is considered as an encoding mechanism, where it defines information models that can be utilized by computing devices and can be used to encode data instances for interoperability. The XML plane represents encoding concerns on how information is to be encoded as bits.

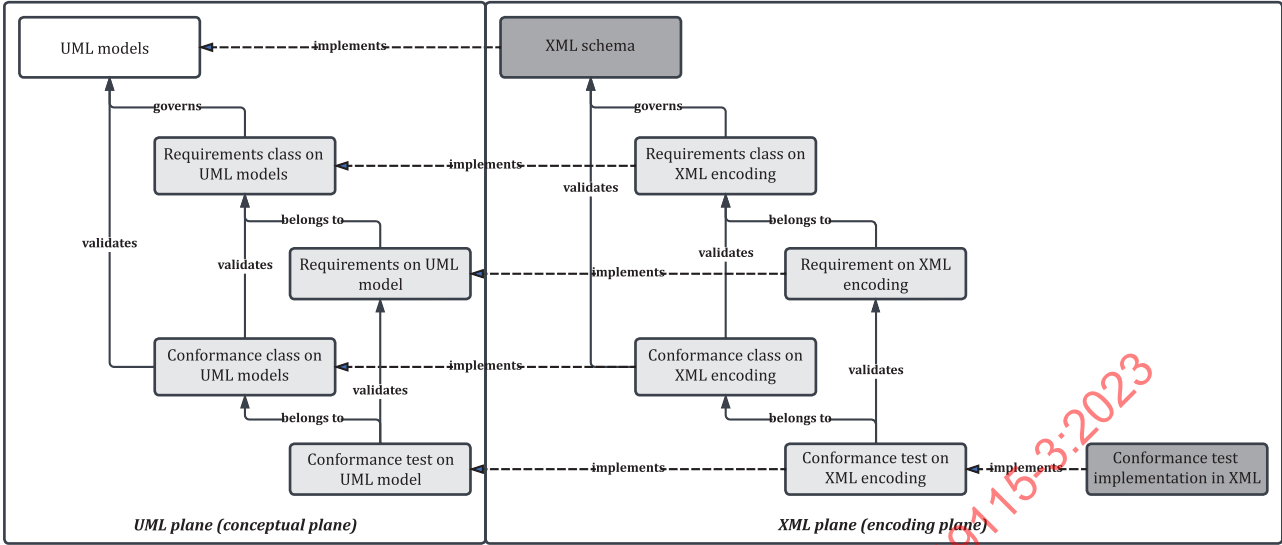
An XML schema is said to implement an UML model when it performs in the same way logically according to the requirements set by the UML model, while enabling the encoding of data into XML documents.

The proper usage of the UML models and XML schemas are governed by the normative statements classes and conformance classes that apply to those UML models or XML schemas.

There is a close relationship between the UML plane and the XML plane. Notably, the XML plane has to at least satisfy all requirements described in the UML plane:

- the XML schema needs to fully satisfy the information requirements stated in the UML model;
- every normative statement class and conformance class that applies to a UML model needs to be satisfied by a corresponding normative statement class and conformance class in the XML plane;
- every normative statement and conformance test that applies to a UML model needs to be satisfied by a corresponding normative statement and conformance test in the XML plane.

Finally, this document also references machine-executable tests (see [Annex A](#)) that implement some conformance tests at the XML plane, which can be seen at the bottom right corner of the [Figure 1](#).



Key

-  platform-independent models
-  platform-specific models
-  requirements scheme instances

Figure 1 — Types of information resources described in this document and their relationships

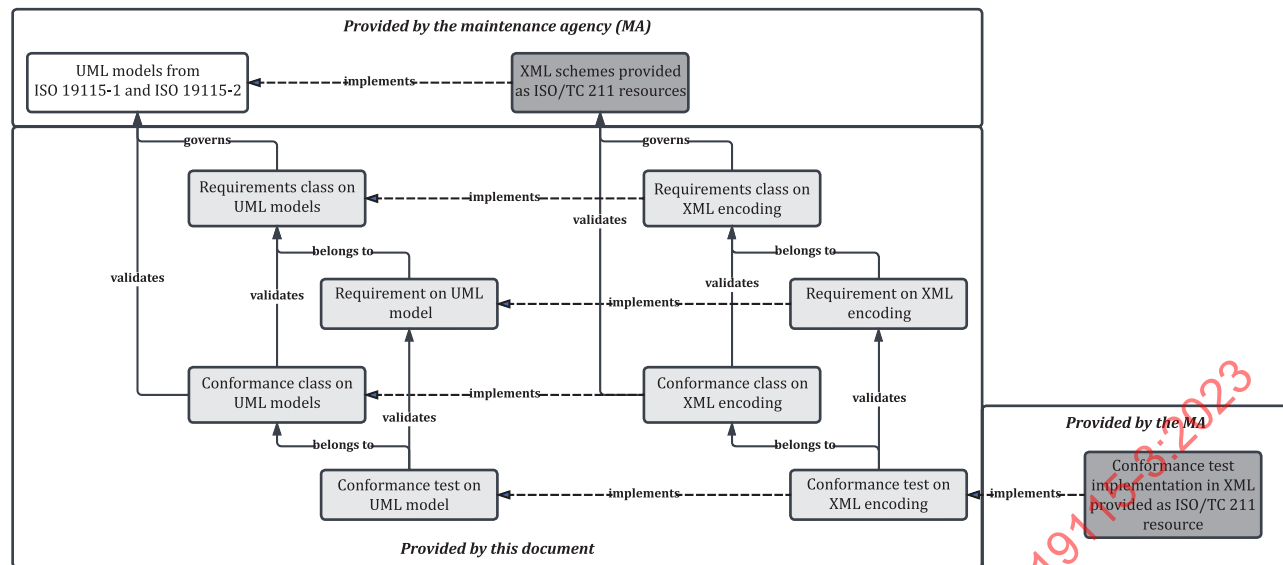
4.4.3 Location of information resources

Certain information resources referenced by this document are managed by a maintenance agency and exist externally.

[Figure 2](#) indicates the location of information resources, whether they are located in this document or managed by the maintenance agency.

[Figure 2](#) is developed on top of [Figure 1](#), which only indicates abstract concepts (such as “XML schemas”), to provide realized information as relating to content described by the current document (such as “XML schemas provided as ISO/TC 211 resources”).

Resources managed by the maintenance agency can be accessed at the corresponding location described at [4.1.1](#).



Key

-  platform-independent models
-  platform-specific models
-  requirements scheme instances

Figure 2 — Location of information resources described in this document

5 XML schemas

5.1 General

XML schemas described in this document are identified by their namespace prefixes and URIs that follow the pattern described in 4.3.4.

This document provides XML schema information relevant to its implementation in the following subclauses:

- tables in 5.2 detail internal XML schema namespace URIs and namespace prefix conventions from ISO 19115-1 and ISO 19115-2, and provide links to their requirements classes and conformance classes;
- tables in 5.3 detail external XML schema namespace URIs and namespace prefix conventions from other specifications outside of ISO 19115-1 and ISO 19115-2.

For every listed XML schema (as identified by a single namespace prefix), the following information is provided.

- UML information:
 - the corresponding UML package that the XML schema implements;
 - the document source of the UML package.
- XML schema information:
 - the scope of the XML schema;
 - the namespace of the XML schema;

- the namespace prefix of the XML schema.
- Normative statement classes relevant to the XML schema.
- Conformance classes relevant to the XML schema.

The relationships between the XML schema and associated information are detailed in [Figure 3](#).

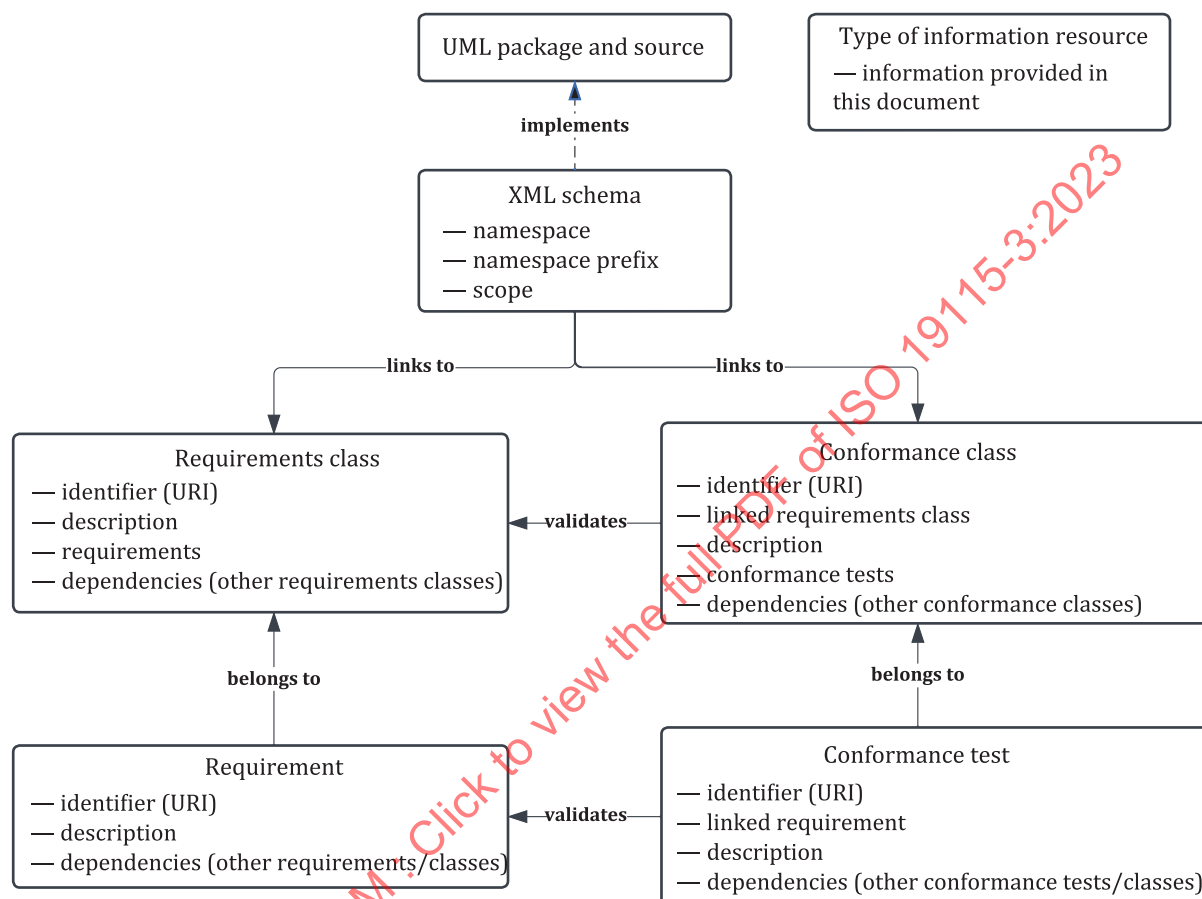


Figure 3 — Overview of XML schemas and their associated information

NOTE 1 XML schemas defined by this document can be found online at the schema location described at [4.3.4](#).

NOTE 2 See [Annex B](#) for additional resources that support usage of the XML schemas defined in this clause.

5.2 XML schemas belonging to the ISO 19115 series

XML schemas belonging to the ISO 19115 series are provided in [Table 5](#) to [Table 23](#).

These schema use a new version of the Geographic Common Objects namespace defined by ISO/TS 19139-1:2019 that is conventionally identified using the prefix `gco` and defined in ISO 19103. Its namespace URI is `https://schemas.isotc211.org/19103/-/gco/1.2`.

Table 5 — XML schema: Metadata application information classes (ISO 19115-1)

Namespace prefix	mda (abbreviation of “MetaData Application”)
Namespace URI	<code>https://schemas.isotc211.org/19115/-1/mda/1.3</code>
UML package name	Metadata application information
UML package source	ISO 19115-1:2014, 6.2

Table 5 (continued)

Scope	Include classes for describing resource collections with hierarchical metadata.
Relevant provision classes and provisions	— Requirements class 6: XML implementation of metadata application information (ISO 19115-1)
Relevant conformance classes and tests	— Conformance class A.6: Validation of XML instance for metadata application information (ISO 19115-1)

Table 6 — XML schema: Metadata information classes (ISO 19115-1)

Namespace prefix	mdb (abbreviation of “MetaData Base”)
Namespace URI	https://schemas.isotc211.org/19115/-1/mdb/1.3
UML package name	Metadata information
UML package source	ISO 19115-1:2014, 6.5.2
Scope	Define metadata root element and properties, with abstract implementation. This namespace is intended to support profile development.
Relevant provision classes and provisions	— Requirements class 7: XML implementation of metadata basic information (ISO 19115-1) — Requirements class 4: Metadata information minimum interchange (ISO 19115-1) — Requirement 1: Metadata basic data requirements
Relevant conformance classes and tests	— Conformance class A.7: Validation of XML instance for metadata basic information (ISO 19115-1) — Conformance class A.4: Validation of minimum valid XML metadata instance (ISO 19115-1) — Conformance test A.1: Metadata basic data requirements

Table 7 — XML schema: Identification information classes (ISO 19115-1)

Namespace prefix	mri (abbreviation of “Metadata for Resource Identification”)
Namespace URI	https://schemas.isotc211.org/19115/-1/mri/1.3
UML package name	Identification information
UML package source	ISO 19115-1:2014, 6.5.3
Scope	Descriptive information about the resource.
Relevant provision classes and provisions	— Requirements class 8: XML implementation of identification information (ISO 19115-1) — Requirements class 4: Metadata information minimum interchange (ISO 19115-1) — Requirement 3: Identification information data requirements
Relevant conformance classes and tests	— Conformance class A.4: Validation of minimum valid XML metadata instance (ISO 19115-1) — Conformance test A.3: Identification information data requirements

Table 8 — XML schema: Constraint information classes (ISO 19115-1)

Namespace prefix	mco (abbreviation of “Metadata for COstraints”)
Namespace URI	https://schemas.isotc211.org/19115/-1/mco/1.3
UML package name	Constraint information
UML package source	ISO 19115-1:2014, 6.5.4
Scope	Specify constraints on access and use.

Table 8 (continued)

Relevant provision classes and provisions	— Requirements class 9: XML implementation of constraint information (ISO 19115-1) — Requirement 4: Constraint information data requirements
Relevant conformance classes and tests	— Conformance test A.4: Constraint information data requirements

Table 9 — XML schema: Lineage information / Extended Lineage information classes (ISO 19115-1)

Namespace prefix	mrl (abbreviation of “Metadata for Resource Lineage”)
Namespace URI	https://schemas.isotc211.org/19115/-1/mrl/1.3
UML package name	Lineage information / Extended Lineage information
UML package source	ISO 19115-1:2014, 6.5.5; ISO 19115-2:2019, 6.3.3
Scope	Resource provenance
Relevant provision classes and provisions	— Requirements class 10: XML implementation of resource lineage information (ISO 19115-1) — Requirement 5: Lineage information data requirements
Relevant conformance classes and tests	— Conformance test A.5: Lineage information data requirements

Table 10 — XML schema: Maintenance information classes (ISO 19115-1)

Namespace prefix	mmi (abbreviation of “Metadata for Maintenance Information”)
Namespace URI	https://schemas.isotc211.org/19115/-1/mmi/1.3
UML package name	Maintenance information
UML package source	ISO 19115-1:2014, 6.5.6
Scope	Maintenance of resources and metadata.
Relevant provision classes and provisions	— Requirements class 11: XML implementation of maintenance information (ISO 19115-1) — Requirement 6: Maintenance information data requirements
Relevant conformance classes and tests	— Conformance test A.6: Maintenance information data requirements

Table 11 — XML schema: Spatial representation information classes (ISO 19115-1)

Namespace prefix	msr (abbreviation of “Metadata for Spatial Representation”)
Namespace URI	https://schemas.isotc211.org/19115/-1/msr/1.3
UML package name	Spatial representation information
UML package source	ISO 19115-1:2014, 6.5.7; ISO 19115-2:2019, 6.3.4
Scope	Encoding of location information in resource content.
Relevant provision classes and provisions	— Requirements class 12: XML implementation of spatial representation information (ISO 19115-1) — Requirement 7: Spatial representation information data requirements
Relevant conformance classes and tests	— Conformance test A.7: Spatial representation information data requirements

Table 12 — XML schema: Reference system information classes (ISO 19115-1)

Namespace prefix	mrs (abbreviation of “Metadata for Reference System”)
Namespace URI	https://schemas.isotc211.org/19115/-1/mrs/1.3
UML package name	Reference system information
UML package source	ISO 19115-1:2014, 6.5.8; ISO 19115-1:2014/Amd 2:2020, 6.5.8
Scope	Spatial reference system for resource content.
Relevant provision classes and provisions	— Requirements class 13: XML implementation of reference system information (ISO 19115-1) — Requirement 8: Reference system information data requirements
Relevant conformance classes and tests	— Conformance test A.8: Reference system information data requirements

Table 13 — XML schema: Content information / Extended Content information classes (ISO 19115-1)

Namespace prefix	mrc (abbreviation of “Metadata for Resource Content”)
Namespace URI	https://schemas.isotc211.org/19115/-1/mrc/1.3
UML package name	Content information / Extended Content information
UML package source	ISO 19115-1:2014, 6.5.9; ISO 19115-2:2019, 6.3.5
Scope	Resource data structure and content.
Relevant provision classes and provisions	— Requirements class 14: XML implementation of content information (ISO 19115-1) — Requirement 9: Content information data requirements
Relevant conformance classes and tests	— Conformance test A.9: Content information data requirements

Table 14 — XML schema: Portrayal catalogue information classes (ISO 19115-1)

Namespace prefix	mpc (abbreviation of “Metadata for Portrayal Catalogue”)
Namespace URI	https://schemas.isotc211.org/19115/-1/mpc/1.3
UML package name	Portrayal catalogue information
UML package source	ISO 19115-1:2014, 6.5.10
Scope	Portrayal of described resource.
Relevant provision classes and provisions	— Requirements class 15: XML implementation of portrayal catalogue information (ISO 19115-1) — Requirement 10: Portrayal catalogue information data requirements
Relevant conformance classes and tests	— Conformance test A.10: Portrayal catalogue information data requirements

Table 15 — XML schema: Distribution information classes (ISO 19115-1)

Namespace prefix	mrd (abbreviation of “Metadata for Resource Distribution”)
Namespace URI	https://schemas.isotc211.org/19115/-1/mrd/1.3
UML package name	Distribution information
UML package source	ISO 19115-1:2014, 6.5.11
Scope	How a resource is distributed.
Relevant provision classes and provisions	— Requirements class 16: XML implementation of distribution information (ISO 19115-1) — Requirement 11: Distribution information data requirements

Table 15 (continued)

Relevant conformance classes and tests	— Conformance test A.11: Distribution information data requirements
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Table 16 — XML schema: Metadata extension information classes (ISO 19115-1)

Namespace prefix	mex (abbreviation of “Metadata for EXtension”)
Namespace URI	https://schemas.isotc211.org/19115/-1/mex/1.3
UML package name	Metadata extension information
UML package source	ISO 19115-1:2014, 6.5.12
Scope	Extensions to metadata content.
Relevant provision classes and provisions	— Requirements class 17: XML implementation of metadata extension information (ISO 19115-1) — Requirement 12: Metadata extension information data requirements
Relevant conformance classes and tests	— Conformance test A.12: Metadata extension information data requirements

Table 17 — XML schema: Application schema information classes (ISO 19115-1)

Namespace prefix	mas (abbreviation of “Metadata for Application Schema”)
Namespace URI	https://schemas.isotc211.org/19115/-1/mas/1.3
UML package name	Application schema information
UML package source	ISO 19115-1:2014, 6.5.13
Scope	Application schema used to build a dataset.
Relevant provision classes and provisions	— Requirements class 18: XML implementation of application schema information (ISO 19115-1) — Requirement 13: Application schema information data requirements
Relevant conformance classes and tests	— Conformance test A.13: Application schema information data requirements

Table 18 — XML schema: Service metadata information classes (ISO 19115-1)

Namespace prefix	srv (abbreviation of “SeRVice metadata”)
Namespace URI	https://schemas.isotc211.org/19115/-1/srv/1.3
UML package name	Service metadata information
UML package source	ISO 19115-1:2014, 6.5.14
Scope	Information specific to service resources.
Relevant provision classes and provisions	— Requirements class 19: XML implementation of service metadata information (ISO 19115-1) — Requirement 14: Service metadata information data requirements
Relevant conformance classes and tests	— Conformance test A.14: Service metadata information data requirements

Table 19 — XML schema: Extent information classes (ISO 19115-1)

Namespace prefix	gex (abbreviation of “Geospatial EXtent”)
Namespace URI	https://schemas.isotc211.org/19115/-1/gex/1.3
UML package name	Extent information
UML package source	ISO 19115-1:2014, 6.6.1

Table 19 (continued)

Scope	Elements for specifying geospatial properties of a resource, including extent and spatial reference systems.
Relevant provision classes and provisions	— Requirements class 20: XML implementation of extent information (ISO 19115-1) — Requirements class 4: Metadata information minimum interchange (ISO 19115-1) — Requirement 15: Extent information data requirements
Relevant conformance classes and tests	— Conformance class A.4: Validation of minimum valid XML metadata instance (ISO 19115-1) — Conformance test A.15: Extent information data requirements

Table 20 — XML schema: Citation and responsible party information classes (ISO 19115-1)

Namespace prefix	cit (abbreviation of "CITation")
Namespace URI	https://schemas.isotc211.org/19115/-1/cit/1.3
UML package name	Citation and responsible party information
UML package source	ISO 19115-1:2014, 6.6.2 and ISO 19115-1:2014, 6.6.3
Scope	Elements for codelist catalogues, and example catalogues.
Relevant provision classes and provisions	— Requirements class 21: XML implementation of citation, responsibility and party information (ISO 19115-1) — Requirements class 4: Metadata information minimum interchange (ISO 19115-1) — Requirement 16: Citation, responsibility and party information data requirements
Relevant conformance classes and tests	— Conformance class A.4: Validation of minimum valid XML metadata instance (ISO 19115-1) — Conformance test A.16: Citation, responsibility and party information data requirements

Table 21 — XML schema: Common classes (ISO 19115-1)

Namespace prefix	mcc (abbreviation of "Metadata for Common Classes")
Namespace URI	https://schemas.isotc211.org/19115/-1/mcc/1.3
UML package name	Common classes
UML package source	ISO 19115-1:2014, 6.6.4
Scope	Elements used by all other packages.
Relevant provision classes and provisions	— Requirements class 22: XML implementation of common classes (ISO 19115-1) — Requirements class 4: Metadata information minimum interchange (ISO 19115-1) — Requirement 17: Commonly used classes data requirements
Relevant conformance classes and tests	— Conformance class A.4: Validation of minimum valid XML metadata instance (ISO 19115-1) — Conformance test A.17: Commonly used classes data requirements

Table 22 — XML schema: Language-character set localization information classes (ISO 19115-1)

Namespace prefix	lan (abbreviation of “LANguage localization”)
Namespace URI	https://schemas.isotc211.org/19115/-1/lan/1.3
UML package name	Language-character set localization information
UML package source	ISO 19115-1:2014, 6.7
Scope	Elements for cultural and linguistic adaptability.
Relevant provision classes and provisions	— Requirements class 23: XML implementation of multilingual support (language localization) (ISO 19115-1) — Requirements class 4: Metadata information minimum interchange (ISO 19115-1) — Requirement 18: Multilingual support data requirements
Relevant conformance classes and tests	— Conformance class A.4: Validation of minimum valid XML metadata instance (ISO 19115-1) — Conformance test A.18: Multilingual support data requirements

Table 23 — XML schema: Acquisition Information classes (ISO 19115-2)

Namespace prefix	mac (abbreviation of “Metadata Acquisition information”)
Namespace URI	https://schemas.isotc211.org/19115/-2/mac/2.2
UML package name	Acquisition information
UML package source	ISO 19115-2:2019, 6.3.2
Scope	Elements for acquisition of spatial data.
Relevant provision classes and provisions	— Requirements class 24: XML implementation of acquisition information (ISO 19115-2) — Requirement 21: Acquisition information data requirements
Relevant conformance classes and tests	— Conformance test A.21: Acquisition information data requirements

5.3 XML schemas outside of the ISO 19115 series

In addition to those namespaces listed in 5.2, this document makes use of the following XML namespaces that are defined outside of the ISO 19115 series.

XML schemas outside of the ISO 19115 series are provided in [Table 24](#) to [Table 32](#).

Table 24 — XML schema: Data quality classes (ISO 19157)

Namespace prefix	dqc (abbreviation of “Data Quality Common”)
Namespace URI	https://schemas.isotc211.org/19157/-2/dqc/1.1
UML package name	Data quality common
UML package source	ISO 19157:2013

Table 25 — XML schema: Feature catalogue classes (ISO 19110)

Namespace prefix	fcc (abbreviation of “Feature Catalogue Common”)
Namespace URI	https://schemas.isotc211.org/19110/-/fcc/2.1
UML package name	Feature catalogue common
UML package source	ISO 19110:2016

Table 26 — XML schema: General feature classes (ISO 19110)

Namespace prefix	gfc (abbreviation of “General Feature Catalogue”)
Namespace URI	https://schemas.isotc211.org/19110/-/gfc/2.1
UML package name	General feature classes
UML package source	ISO 19110:2016

Table 27 — XML schema: Geospatial common type classes (ISO 19103)

Namespace prefix	gco (abbreviation of “Geospatial Common Objects”)
Namespace URI	https://schemas.isotc211.org/19103/-/gco/1.2
UML package name	Geospatial common objects
UML package source	ISO 19103:2015

Table 28 — XML schema: Geospatial Common Extended Type classes (ISO 19103)

Namespace prefix	gcx (abbreviation of “Geospatial Common objects extended”)
Namespace URI	https://schemas.isotc211.org/19103/-/gcx/1.2
UML package name	Geospatial common objects extended
UML package source	ISO 19103:2015

Table 29 — XML schema: Geography Markup Language wrapper classes (ISO 19136-1)

Namespace prefix	gmw (abbreviation of “Geography Markup language Wrapper”)
Namespace URI	https://schemas.isotc211.org/19136/-1/gmw/1.1
UML package name	GML wrapper
UML package source	ISO 19136-1:2020
Scope	Namespace that implements properties with values specified by GML classes

Table 30 — XML schema: Geography Markup Language (GML) classes (OGC GML 3.2)^[15]

Namespace prefix	gml (abbreviation of “Geography Markup Language”)
Namespace URI	http://www.opengis.net/gml/3.2
UML package name	Geography markup language
UML package source	Geography Markup Language version 3.2 (OGC 02-009)
Guidance	Authoritative XML schemas located at http://schemas.opengis.net/gml/3.2.1/gml.xsd

Table 31 — XML schema: XML linking (W3C xlink)^[16]

Namespace prefix	xlink (abbreviation of “Xml LINKing language”)
Namespace URI	https://www.w3.org/1999/xlink
UML package name	XML linking language
UML package source	W3C XML Linking Language version 1.0 (W3C xlink11)
Guidance	To locate the authoritative XML schemas associated with this namespace, also refer to ISO 19136-1:2020.

Table 32 — XML schema: Schema definition classes (W3C XMLSchema)^[19]

Namespace prefix	xs (abbreviation of “Xml Schema”)
Namespace URI	https://www.w3.org/2001/XMLSchema
UML package name	W3C XML schema definition schema
UML package source	W3C

5.4 XML schemas required for a minimum metadata interchange XML document

This document defines requirements for a minimum metadata interchange XML document, described in [Clause 7](#).

Namespace URIs and namespace prefix conventions for a minimum metadata interchange XML document type, which aggregate multiple namespaces and conformance classes, are listed in Conformance class A.4: Validation of minimum valid XML metadata instance (ISO 19115-1).

The minimal set of XML schemas needed to satisfy the requirements are described in this subclause (see [Table 33](#)).

Table 33 — XML schema: Namespaces for minimum metadata instance (ISO 19115-1)

Namespace prefix	mdb, mri, cit, mcc, lan, gco (if dataset, gex; if service, srv)
Namespace URI	— https://schemas.isotc211.org/19115/-1/mdb/1.3 — https://schemas.isotc211.org/19115/-1/mri/1.3 — https://schemas.isotc211.org/19115/-1/cit/1.3 — https://schemas.isotc211.org/19115/-1/mcc/1.3 — https://schemas.isotc211.org/19115/-1/lan/1.3 — https://schemas.isotc211.org/19103/-/gco/1.2 — https://schemas.isotc211.org/19115/-1/gex/1.3 — https://schemas.isotc211.org/19115/-1/srv/1.3
UML package name	Valid minimum metadata instance
UML package source	ISO 19115-1:2014, 6.2
Scope	Implement elements and properties for minimal metadata properties required by ISO 19115-1:2014.
Relevant conformance classes and tests	— Conformance class A.7: Validation of XML instance for metadata basic information (ISO 19115-1) — Conformance class A.8: Validation of XML instance for identification information (ISO 19115-1) — Conformance class A.21: Validation of XML instance for citation, responsibility and party information (ISO 19115-1) — Conformance class A.22: Validation of XML instance for common classes (ISO 19115-1) — Conformance class A.23: Validation of XML instance for multilingual support (language localization) (ISO 19115-1) — Conformance class A.20: Validation of XML instance for extent information (ISO 19115-1) — Conformance class A.19: Validation of XML instance for service metadata information (ISO 19115-1)

Table 33 (continued)

Guidance	— Importing of namespace https://schemas.isotc211.org/19115/-1/gex/1.3 and conformance to Conformance class A.20: Validation of XML instance for extent information (ISO 19115-1) only needed for datasets.
	— Importing of namespace https://schemas.isotc211.org/19115/-1/srv/1.3 and conformance to Conformance class A.19: Validation of XML instance for service metadata information (ISO 19115-1) only needed for services.

6 Requirements of ISO 19115-1:2014 and ISO 19115-2:2019

6.1 General

ISO 19115-1:2014 and ISO 19115-2:2019 provide conceptual models for representing metadata of geographic information resources.

While ISO 19115-1:2014 and ISO 19115-2:2019 describe conformance requirements and allow for “user-defined metadata” and “profiles”, they do not explicitly define normative statement classes, specification targets, or assign identifiers for these elements.

This document formally defines the normative statement classes, normative statements, conformance classes, conformance tests of ISO 19115-1:2014 and ISO 19115-2:2019, and assigns identifiers to them.

6.2 Metadata modules

Prefixes and other information for namespaces specified in UML packages defined in ISO 19115-1:2014 and ISO 19115-2:2019 are described in [Table 34](#) to [Table 58](#).

Table 34 — Requirements class 1: Metadata core (ISO 19115-1)

Identifier	https://standards.isotc211.org/19115/-1/1/req/metadata-core
Target type	Metadata instance
Conformance class	Conformance class A.1: Metadata core (ISO 19115-1)
Source	ISO 19115-1:2014, Clause 6
Description	Metadata core

Table 34 (continued)

Provisions	Requirement 1: Metadata basic data requirements
	Requirement 2: Metadata application information data requirements
	Requirement 3: Identification information data requirements
	Requirement 4: Constraint information data requirements
	Requirement 5: Lineage information data requirements
	Requirement 6: Maintenance information data requirements
	Requirement 7: Spatial representation information data requirements
	Requirement 8: Reference system information data requirements
	Requirement 9: Content information data requirements
	Requirement 10: Portrayal catalogue information data requirements
	Requirement 11: Distribution information data requirements
	Requirement 12: Metadata extension information data requirements
	Requirement 13: Application schema information data requirements
	Requirement 14: Service metadata information data requirements
	Requirement 15: Extent information data requirements
	Requirement 16: Citation, responsibility and party information data requirements
	Requirement 17: Commonly used classes data requirements
	Requirement 18: Multilingual support data requirements

Table 35 — Requirement 1: Metadata basic data requirements

Identifier	https://standards.iso/2011.org/19115/-1/1/req/metadata-core/basic
Subject	Metadata instance
Included in	Requirements class 1: Metadata core (ISO 19115-1)
UML source	ISO 19115-1:2014, 6.5.2
UML package	MD_Metadata
Statement	A metadata instance shall adhere to rules defined in ISO 19115-1:2014, 6.5.2.

Table 36 — Requirement 2: Metadata application information data requirements

Identifier	https://standards.iso/2011.org/19115/-1/1/req/metadata-core/application
Subject	Metadata instance
Included in	Requirements class 1: Metadata core (ISO 19115-1)
UML source	ISO 19115-1:2014, 6.2
UML package	See ISO 19115-1:2014, 6.2
Statement	A metadata instance shall adhere to rules defined in ISO 19115-1:2014, 6.2.

Table 37 — Requirement 3: Identification information data requirements

Identifier	https://standards.iso/2011.org/19115/-1/1/req/metadata-core/identification
Subject	Metadata instance
Included in	Requirements class 1: Metadata core (ISO 19115-1)
UML source	ISO 19115-1:2014, 6.5.3

Table 37 (continued)

UML package	MD_Identification
Statement	A metadata instance shall adhere to rules defined in ISO 19115-1:2014, 6.5.3.

Table 38 — Requirement 4: Constraint information data requirements

Identifier	https://standards.iso211.org/19115/-1/1/req/metadata-core/constraints
Subject	Metadata instance
Included in	Requirements class 1: Metadata core (ISO 19115-1)
UML source	ISO 19115-1:2014, 6.5.4
UML package	MD_Constraints
Statement	A metadata instance shall adhere to rules defined in ISO 19115-1:2014, 6.5.4.

Table 39 — Requirement 5: Lineage information data requirements

Identifier	https://standards.iso211.org/19115/-1/1/req/metadata-core/lineage
Subject	Metadata instance
Included in	Requirements class 1: Metadata core (ISO 19115-1)
UML source	ISO 19115-1:2014, 6.5.5; ISO 19115-2:2019, 6.3.3
UML package	LI_Lineage
Statement	A metadata instance shall adhere to rules defined in ISO 19115-1:2014, 6.5.5.

Table 40 — Requirement 6: Maintenance information data requirements

Identifier	https://standards.iso211.org/19115/-1/1/req/metadata-core/maintenance
Subject	Metadata instance
Included in	Requirements class 1: Metadata core (ISO 19115-1)
UML source	ISO 19115-1:2014, 6.5.6
UML package	MD_MaintenanceInformation
Statement	A metadata instance shall adhere to rules defined in ISO 19115-1:2014, 6.5.6.

Table 41 — Requirement 7: Spatial representation information data requirements

Identifier	https://standards.iso211.org/19115/-1/1/req/metadata-core/spatial-representation
Subject	Metadata instance
Included in	Requirements class 1: Metadata core (ISO 19115-1)
UML source	ISO 19115-1:2014, 6.5.7; ISO 19115-2:2019, 6.3.4
UML package	MD_SpatialRepresentation
Statement	A metadata instance shall adhere to rules defined in ISO 19115-1:2014, 6.5.7.

Table 42 — Requirement 8: Reference system information data requirements

Identifier	https://standards.iso211.org/19115/-1/1/req/metadata-core/reference-system
Subject	Metadata instance
Included in	Requirements class 1: Metadata core (ISO 19115-1)
UML source	ISO 19115-1:2014, 6.5.8; ISO 19115-1:2014/Amd 2:2020, 6.5.8

Table 42 (continued)

UML package	MD_ReferenceSystem
Statement	A metadata instance shall adhere to rules defined in ISO 19115-1:2014, 6.5.8.

Table 43 — Requirement 9: Content information data requirements

Identifier	https://standards.iso/19115-3:2023/1/req/metadata-core/content
Subject	Metadata instance
Included in	Requirements class 1: Metadata core (ISO 19115-1)
UML source	ISO 19115-1:2014, 6.5.9; ISO 19115-2:2019, 6.3.5
UML package	MD_ContentInformation
Statement	A metadata instance shall adhere to rules defined in ISO 19115-1:2014, 6.5.9.

Table 44 — Requirement 10: Portrayal catalogue information data requirements

Identifier	https://standards.iso/19115-3:2023/1/req/metadata-core/portrayal-catalogue
Subject	Metadata instance
Included in	Requirements class 1: Metadata core (ISO 19115-1)
UML source	ISO 19115-1:2014, 6.5.10
UML package	MD_PortrayalCatalogueReference
Statement	A metadata instance shall adhere to rules defined in ISO 19115-1:2014, 6.5.10.

Table 45 — Requirement 11: Distribution information data requirements

Identifier	https://standards.iso/19115-3:2023/1/req/metadata-core/distribution
Subject	Metadata instance
Included in	Requirements class 1: Metadata core (ISO 19115-1)
UML source	ISO 19115-1:2014, 6.5.11
UML package	MD_Distribution
Statement	A metadata instance shall adhere to rules defined in ISO 19115-1:2014, 6.5.11.

Table 46 — Requirement 12: Metadata extension information data requirements

Identifier	https://standards.iso/19115-3:2023/1/req/metadata-core/metadata-extension
Subject	Metadata instance
Included in	Requirements class 1: Metadata core (ISO 19115-1)
UML source	ISO 19115-1:2014, 6.5.12
UML package	MD_MetadataExtensionInformation
Statement	A metadata instance shall adhere to rules defined in ISO 19115-1:2014, 6.5.12.

Table 47 — Requirement 13: Application schema information data requirements

Identifier	https://standards.iso/211.org/19115/-1/1/req/metadata-core/application-schema
Subject	Metadata instance
Included in	Requirements class 1: Metadata core (ISO 19115-1)
UML source	ISO 19115-1:2014, 6.5.13
UML package	MD_ApplicationSchemaInformation
Statement	A metadata instance shall adhere to rules defined in ISO 19115-1:2014, 6.5.13.

Table 48 — Requirement 14: Service metadata information data requirements

Identifier	https://standards.iso/211.org/19115/-1/1/req/metadata-core/service-metadata
Subject	Metadata instance
Included in	Requirements class 1: Metadata core (ISO 19115-1)
UML source	ISO 19115-1:2014, 6.5.14
UML package	Service metadata information (including SV_ServiceIdentification, SV_OperationMetadata, MD_DataIdentification)
Statement	A metadata instance shall adhere to rules defined in ISO 19115-1:2014, 6.5.14.

Table 49 — Requirement 15: Extent information data requirements

Identifier	https://standards.iso/211.org/19115/-1/1/req/metadata-core/extent
Subject	Metadata instance
Included in	Requirements class 1: Metadata core (ISO 19115-1)
UML source	ISO 19115-1:2014, 6.6.1
UML package	EX_Extent
Statement	A metadata instance shall adhere to rules defined in ISO 19115-1:2014, 6.6.1.

Table 50 — Requirement 16: Citation, responsibility and party information data requirements

Identifier	https://standards.iso/211.org/19115/-1/1/req/metadata-core/citation
Subject	Metadata instance
Included in	Requirements class 1: Metadata core (ISO 19115-1)
UML source	ISO 19115-1:2014, 6.6.2 and ISO 19115-1:2014, 6.6.3
UML package	CI_Citation, CI_Responsibility, CI_Party
Statement	A metadata instance shall adhere to rules defined in ISO 19115-1:2014, 6.6.2, 6.6.3.

Table 51 — Requirement 17: Commonly used classes data requirements

Identifier	https://standards.iso/211.org/19115/-1/1/req/metadata-core/common
Subject	Metadata instance
Included in	Requirements class 1: Metadata core (ISO 19115-1)
UML source	ISO 19115-1:2014, 6.6.4
UML package	Common classes
Statement	A metadata instance shall adhere to rules defined in ISO 19115-1:2014, 6.6.4.

Table 52 — Requirement 18: Multilingual support data requirements

Identifier	https://standards.iso/19115/-1/1/req/metadata-core/multilingual
Subject	Metadata instance
Included in	Requirements class 1: Metadata core (ISO 19115-1)
UML source	ISO 19115-1:2014, 6.7
UML package	PT_Locale
Statement	A metadata instance shall adhere to rules defined in ISO 19115-1:2014, 6.7 and ISO/TS 19139-1:2019, 7.3.

Table 53 — Requirements class 2: Metadata extensions and profiles (ISO 19115-1)

Identifier	https://standards.iso/19115/-1/1/req/metadata-extend
Target type	Metadata scheme
Conformance class	Conformance class A.2: Metadata extensions and profiles (ISO 19115-1)
Prerequisite	Requirements class 1: Metadata core (ISO 19115-1)
Source	ISO 19115-1:2014, Annex C
Description	Metadata extensions and profiles
Provisions	Requirement 19: Metadata extension Requirement 20: Metadata profile

Table 54 — Requirement 19: Metadata extension

Identifier	https://standards.iso/19115/-1/1/req/metadata-extend/extension
Subject	Metadata scheme
Included in	Requirements class 2: Metadata extensions and profiles (ISO 19115-1)
Statement	A metadata extension scheme shall adhere to rules defined in ISO 19115-1:2014, C.3, C.4.

Table 55 — Requirement 20: Metadata profile

Identifier	https://standards.iso/19115/-1/1/req/metadata-extend/profile
Subject	Metadata scheme
Included in	Requirements class 2: Metadata extensions and profiles (ISO 19115-1)
Statement	A metadata profile shall adhere to rules defined in ISO 19115-1:2014, C.5, C.6.
Guidance	Re-used by reference in ISO 19115-2:2019.

Table 56 — Requirements class 3: Extensions for acquisition and processing (ISO 19115-2)

Identifier	https://standards.iso/19115/-2/2/req/metadata-extensions
Target type	Metadata instance
Conformance class	Conformance class A.3: Extensions for acquisition and processing (ISO 19115-2)
Prerequisite	Requirements class 1: Metadata core (ISO 19115-1)
Source	ISO 19115-2:2019, 6.3
Description	Extensions for acquisition and processing
Provisions	Requirement 21: Acquisition information data requirements Requirement 22: Extended lineage information data requirements

Table 57 — Requirement 21: Acquisition information data requirements

Identifier	https://standards.iso/211.org/19115/-2/2/req/metadata-extensions/acquisition
Subject	Metadata instance
Included in	Requirements class 3: Extensions for acquisition and processing (ISO 19115-2)
UML source	ISO 19115-2:2019, 6.3.2
UML package	See ISO 19115-2:2019, 6.3.2
Statement	A metadata instance shall adhere to rules defined in ISO 19115-2:2019, 6.3.2.

Table 58 — Requirement 22: Extended lineage information data requirements

Identifier	https://standards.iso/211.org/19115/-2/2/req/metadata-extensions/extended-lineage
Subject	Metadata instance
Included in	Requirements class 3: Extensions for acquisition and processing (ISO 19115-2)
Prerequisite	Requirement 5: Lineage information data requirements
UML source	ISO 19115-2:2019, 6.3.3
UML package	See ISO 19115-2:2019, 6.3.3
Statement	A metadata instance shall adhere to rules defined in ISO 19115-2:2019, 6.3.3.

The conformance classes and tests of ISO 19115-1 and ISO 19115-2 defined in this document are available in [Clause A.2](#).

7 Requirements for metadata interchange documents

In order to foster metadata interoperability, this document defines a requirements class for a minimum metadata instance that allows progressively increasing capability for describing resources and their relationships through extension.

Requirements for the minimum metadata instance shall be in accordance with ISO 19115-1:2014, ISO 19115-1:2014/Amd 1:2018 and ISO 19115-1:2014/Amd 2:2020 collectively.

A valid minimal metadata instance is defined as an XML instance satisfying the following core conditions, as follows.

- It is a well-formed XML instance, with `MD_Metadata` as its root element (see Requirement 25: Root element of the metadata minimal instance is an `MD_Metadata` element, [Table 62](#)).
- It includes contact information related to the metadata (`MD_Metadata.contact` takes a `CI_Responsibility` object, see ISO 19115-1:2014, 6.5.2) (see Requirement 26: Provides contact information related to the metadata, [Table 63](#)).
- It includes metadata date where `dateType = "creation"` (`MD_Metadata.dateInfo` takes a `CI_Date` object, see ISO 19115-1:2014, 6.5.2) (see Requirement 27: Provides creation date of the metadata, [Table 64](#)).
- If the metadata is not about a dataset, the `MD_Metadata.metadataScope` attribute has to be provided in the form of an `MD_MetadataScope` instance. If not provided, the `MD_Metadata.metadataScope` object points to a default type of "dataset" (see Requirement 28: Provides metadata scope of the metadata, [Table 65](#)).
- It includes an identification object under `MD_Metadata.identificationInfo` (which takes an instance for identification, see ISO 19115-1:2014, 6.5.3), of which the value class depends on

the value of `MD_Metadata.metadataScope` (see Requirements class 8: XML implementation of identification information (ISO 19115-1), [Table 81](#)).

- 1) If the `MD_Metadata.metadataScope` instance has attribute `resourceScope` pointing to an `MD_ScopeCode` value of `service`, the identification object is an instance of `SV_ServiceIdentification`.
 - i) In an `SV_ServiceIdentification` instance, the attribute `serviceType` is mandatory. (see Requirement 91: Provides service type, [Table 143](#))
 - 2) Otherwise, the identification object is an instance of `MD_DataIdentification`.
- f) If `MD_Metadata.metadataScope` has a value of “dataset”, the object referenced by the `MD_Metadata.identificationInfo` shall provide a geographic extent (see Requirement 44: Provides geographic extent of dataset, [Table 85](#)), as one of the following:
- 1) `extent.geographicElement.EX_GeographicBoundingBox`, describing a bounding box with N/S/E/W, latitude and longitude; or
 - 2) `extent.geographicElement.EX_GeographicDescription`, describing an extent with an identifier code.
- g) If `MD_Metadata.metadataScope` has a value of “service” or “dataset”, the attribute `MD_Metadata.topicCategory` is mandatory (see Requirement 45: Topic category of resource identification instance, [Table 86](#)).

To validate the above conditions, it is sufficient to have the XML instance validated against the required XML schemas and their corresponding Schematrons.

The above conditions are formally expressed as requirements in [Table 59](#) to [Table 68](#).

Table 59 — Requirements class 4: Metadata information minimum interchange (ISO 19115-1)

Identifier	https://standards.iso.org/19115/-1/1/req/metadata-minimal-xml
Target type	Metadata instance
Conformance class	Conformance class A.4: Validation of minimum valid XML metadata instance (ISO 19115-1)
Prerequisites	Requirements class 7: XML implementation of metadata basic information (ISO 19115-1) Requirements class 21: XML implementation of citation, responsibility and party information (ISO 19115-1) Requirements class 22: XML implementation of common classes (ISO 19115-1) Requirements class 8: XML implementation of identification information (ISO 19115-1) Requirements class 23: XML implementation of multilingual support (language localization) (ISO 19115-1) Requirements class 20: XML implementation of extent information (ISO 19115-1) Requirements class 19: XML implementation of service metadata information (ISO 19115-1)
Description	Metadata information minimum interchange.

Table 59 (continued)

Provisions	Requirement 23: Valid minimum metadata XML instance
	Requirement 24: Namespaces required by minimum metadata XML instance
	Requirement 25: Root element of the metadata minimal instance is an MD_Metadata element
	Requirement 26: Provides contact information related to the metadata
	Requirement 27: Provides creation date of the metadata
	Requirement 28: Provides metadata scope of the metadata
	Requirement 29: Provides identification of the metadata
	Requirement 30: Defines necessary abstract classes
	Requirement 31: Allowed namespaces of the metadata minimal instance
Guidance	— If the scope of the metadata is equal to “dataset”, the Requirements class 20: XML implementation of extent information (ISO 19115-1) requirements class applies.
	— If the scope of the metadata is equal to “service”, the Requirements class 19: XML implementation of service metadata information (ISO 19115-1) requirements class applies.

Table 60 — Requirement 23: Valid minimum metadata XML instance

Identifier	https://standards.iso/2011.org/19115/-1/1/req/metadata-minimal-xml/valid
Included in	Requirements class 4: Metadata information minimum interchange (ISO 19115-1)
Statement	A minimal metadata XML instance document shall be well-formed and valid.

Table 61 — Requirement 24: Namespaces required by minimum metadata XML instance

Identifier	https://standards.iso/2011.org/19115/-1/1/req/metadata-minimal-xml/namespaces
Included in	Requirements class 4: Metadata information minimum interchange (ISO 19115-1)
Statement	A minimal metadata XML instance document shall at least import the following XML namespaces: <code>mdb</code> , <code>mcc</code> , <code>mri</code> , <code>lan</code> , <code>cit</code> , <code>gco</code> (optional: <code>gex</code> , <code>srv</code>).
Guidance	— If the scope of the metadata is equal to <code>dataset</code> , the Requirements class 20: XML implementation of extent information (ISO 19115-1) requirements class applies, which requires importing the <code>gex</code> namespace.
	— If the scope of the metadata is equal to <code>service</code> , the Requirements class 19: XML implementation of service metadata information (ISO 19115-1) requirements class applies, which requires importing the <code>srv</code> namespace.
	— The <code>mdb</code> namespace is needed for the definition of MD_Metadata.
	— The <code>mcc</code> namespace is needed for the definition of MD_MetadataScope.
	— The <code>mri</code> namespace is needed for the definition of MD_Identification.
	— The <code>gco</code> namespace is needed for the definition of CharacterString.
	— The <code>lan</code> namespace is needed for the definition of PT_Locale.
	— The <code>cit</code> namespace is needed for the definition of CI_Citation, CI_Date.
	— The <code>gex</code> namespace is needed for the definition of EX_GeographicBoundingBox, EX_GeographicDescription.
	— The <code>srv</code> namespace is needed for the definition of SV_ServiceIdentification.

Table 62 — Requirement 25: Root element of the metadata minimal instance is an MD_Metadata element

Identifier	https://standards.iso211.org/19115/-1/1/req/metadata-minimal-xml/root-element
Included in	Requirements class 4: Metadata information minimum interchange (ISO 19115-1)
Statement	A minimal metadata XML instance document shall have the root element be an MD_Metadata element.

Table 63 — Requirement 26: Provides contact information related to the metadata

Identifier	https://standards.iso211.org/19115/-1/1/req/metadata-minimal-xml/contact-information
Included in	Requirements class 4: Metadata information minimum interchange (ISO 19115-1)
Prerequisite	Requirements class 21: XML implementation of citation, responsibility and party information (ISO 19115-1)
Statement	A minimal metadata XML instance document shall provide contact information in the MD_Metadata element attribute contact in form of a CI_Responsibility element, to substitute for mcc:Abstract_Responsibility.

Table 64 — Requirement 27: Provides creation date of the metadata

Identifier	https://standards.iso211.org/19115/-1/1/req/metadata-minimal-xml/creation-date
Included in	Requirements class 4: Metadata information minimum interchange (ISO 19115-1)
Statement	A minimal metadata XML instance document shall provide creation date information in the MD_Metadata element attribute dateInfo in form of a CI_Date element, with date type creation.

Table 65 — Requirement 28: Provides metadata scope of the metadata

Identifier	https://standards.iso211.org/19115/-1/1/req/metadata-minimal-xml/metadata-scope
Included in	Requirements class 4: Metadata information minimum interchange (ISO 19115-1)
Statement	If the scope of the metadata is not about a dataset, the minimal metadata XML instance document shall provide the scope of the metadata in the MD_Metadata element under the metadataScope attribute with an MD_MetadataScope instance.

Table 66 — Requirement 29: Provides identification of the metadata

Identifier	https://standards.iso211.org/19115/-1/1/req/metadata-minimal-xml/identification
Included in	Requirements class 4: Metadata information minimum interchange (ISO 19115-1)
Prerequisite	Requirements class 8: XML implementation of identification information (ISO 19115-1)
Statement	A minimal metadata XML instance document shall provide an identification object in the MD_Metadata element under the identificationInfo attribute. The value of such depends on the value of MD_Metadata.metadataScope: if its attribute resourceScope has the MD_ScopeCode value of service, the identification object shall be an instance of srv:SV_ServiceIdentification. Otherwise, it shall be an instance of mri:MD_DataIdentification. In the case of srv:SV_ServiceIdentification, the attribute MD_Identification.citation.CI_Citation.title is a mandatory substitution for mcc:Abstract_Citation.

Table 67 — Requirement 30: Defines necessary abstract classes

Identifier	https://standards.iso/19115-3:2023/req/metadata-minimal-xml/defines-abstract-classes
Included in	Requirements class 4: Metadata information minimum interchange (ISO 19115-1)
Statement	A minimal metadata XML instance document shall define the abstract classes necessary from the XML namespace <code>mcc</code> in order to construct XML schema according to the implementation rule in ISO/TS 19139-1:2019, 8.2. The data types required for properties on various mandatory elements are: <code>Abstract_ResourceDescription</code> , <code>Abstract_Extent</code> , <code>Abstract_TypedDate</code> , and <code>Abstract_Responsibility</code> .
Guidance	While these classes do not appear in instance documents, the <code>mcc</code> namespace schema needs to be imported to validate documents.

Table 68 — Requirement 31: Allowed namespaces of the metadata minimal instance

Identifier	https://standards.iso/19115-3:2023/req/metadata-minimal-xml/allowed-namespaces
Included in	Requirements class 4: Metadata information minimum interchange (ISO 19115-1)
Statement	A minimal metadata XML instance document shall include inline elements to instantiate abstract property value data types that are defined in the <code>cit</code> and <code>mri</code> namespaces, and conditionally, in the <code>srv</code> or <code>gex</code> namespaces.

8 Requirements for defined XML encodings

8.1 General

8.1.1 Approach

The requirements for creating valid XML metadata instances for the conceptual model presented in ISO 19115-1 and ISO 19115-2 are defined in this clause.

These requirements stem from the conceptual model, so they are identified as requirements of ISO 19115-1 and ISO 19115-2.

The conformance of a metadata instance towards ISO 19115-1 and ISO 19115-2 depends on its conformance to one or more of the following requirements classes:

- Requirements class 1: Metadata core (ISO 19115-1) (mandatory)
- Requirements class 2: Metadata extensions and profiles (ISO 19115-1) (optional)
- Requirements class 3: Extensions for acquisition and processing (ISO 19115-2) (optional)

This document defines mechanisms by which an XML implementation (and an XML-encoded metadata instance) can be shown to conform to these requirements.

The corresponding conformance tests are defined in [Clause A.3](#).

8.1.2 Grouping of requirements in XML

Each implemented package defines requirements for validating XML instances that use elements in the package. The requirements are grouped into core requirements that apply to all instance validation, requirements for metadata modules that define the various components of metadata content, and requirements for actual metadata interchange documents that are assembled by importing collections of modules. The metadata modules are designed to minimize dependencies between modules to facilitate their reuse in other application schema.

8.1.3 Executable test suite

This document provides an executable test suite implementing the ISO 19115-1 and ISO 19115-2 abstract test suites in the context of an XML implementation.

The executable test suite is provided in the form of XML schema documents and Schematron rules, where an XML instance can be validated against the requirements of this document in a machine-executable manner, as described in [Annex A](#).

Due to the modular nature of ISO 19115-1 and ISO 19115-2, each requirements “super class” contains optional packages and elements. The overall requirement is that the metadata be provided as specified. The actual requirements classes correspond to the clauses in the document and the packages in the UML model. Following ISO/TS 19139-1:2019, each UML package results in a separate XML namespace.

8.2 Requirements not validated by this document

Some requirements from models specified in ISO 19115-1 and ISO 19115-2 (including ISO 19115-1:2014/Amd 1:2018, ISO 19115-1:2014/Amd 2:2020 and ISO 19115-2:2019/Amd 1:2022) are not validated by resources provided by this document. These are listed in [A.3.6](#).

Other automatic or manual validation, defined outside of this document, may be applied for these requirements.

8.3 Using and extending XML resources

There are various ways to use and extend the XML schemas and the executable test suite provided by this document.

An XML implementation schema should be generated that conforms to ISO/TS 19139-1:2019, in the same way that this document does.

- Where an XML implementation schema uses the ISO 19115 series in a manner constrained by a community profile, the schema may import selected modules from this document or may test those constraints using additional community-specific Schematron rules.
- Where a community extends the ISO 19115 series, it follows the rules in ISO 19115-1:2014, Clause C.5 and Clause C.6. The extensions should follow the rules in ISO 19115-1:2014, Clause C.3 and Clause C.4.

Implementers may choose to define other “information exchange” document schemas that import normative XML schemas in addition to those specified here to identify and use them to validate interchange documents. The design of these schemas will be contingent on the requirements of the user community for the particular information exchange. These information exchange schemas should be documented in a technical note.

8.4 Requirements for XML validity

This document introduces the following requirements on the validity of XML instances. The corresponding conformance class is at [A.3.3](#).

The requirements are described in Requirements class 5: Validity of XML instance documents (ISO 19115-3) ([Table 69](#) to [Table 71](#)).

Table 69 — Requirements class 5: Validity of XML instance documents (ISO 19115-3)

Identifier	https://standards.iso211.org/19115/-3/2/req/valid-instance
Conformance class	Conformance class A.5: Validation of the XML instance. (ISO 19115-3)
Description	Validity of XML instance documents
Provisions	Requirement 32: Validity of XML instance via XSD Requirement 33: Validity of XML instance via Schematron

Table 70 — Requirement 32: Validity of XML instance via XSD

Identifier	https://standards.iso211.org/19115/-3/2/req/valid-instance/xsd
Included in	Requirements class 5: Validity of XML instance documents (ISO 19115-3)
Statement	The instance document is valid against XSD validation.

Table 71 — Requirement 33: Validity of XML instance via Schematron

Identifier	https://standards.iso211.org/19115/-3/2/req/valid-instance/schematron
Included in	Requirements class 5: Validity of XML instance documents (ISO 19115-3)
Statement	The instance document is valid against Schematron validation.

8.5 Requirements for metadata modules in XML

8.5.1 General

This document defines a set of XML schema and conformance classes for various content modules defined by ISO 19115-1 and ISO 19115-2, in order to allow these to be used as components in other interchange document implementations. Each module is packaged in a separate XML namespace.

The modules and the requirements for XML instances of each module with assigned identifiers are defined and summarized in this subclause.

The identifiers are referenced in the definition of conformance classes and tests in [Annex A](#).

NOTE Validation requirements for all modules are the same. Each module has a validation requirement that reflects the validation requirement of the core requirements, and is associated with a conformance class that defines the XML schema and Schematron rule set used to test validation.

8.5.2 Derived from ISO 19115-1

The metadata modules defined by this document, the clauses they implement and the requirements classes for XML instance documents for each namespace module derived from ISO 19115-1, are described in [Table 72](#) to [Table 160](#).

Table 72 — Requirements class 6: XML implementation of metadata application information (ISO 19115-1)

Identifier	https://standards.iso211.org/19115/-1/1/req/metadata-xml/application
Conformance class	Conformance class A.6: Validation of XML instance for metadata application information (ISO 19115-1)
Implements	Requirement 2: Metadata application information data requirements
XML prefix	mda (abbreviation of “MetaData Application”)
XML namespace	https://schemas.iso211.org/19115/-1/mda/1.3
XML description	Include classes for describing resource collections with hierarchical metadata.
Description	XML implementation of metadata application information.

Table 72 (continued)

Provision	Requirement 34: Valid metadata application instance
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Table 73 — Requirement 34: Valid metadata application instance

Identifier	https://standards.iso211.org/19115/-1/1/req/metadata-xml/application/valid
Included in	Requirements class 6: XML implementation of metadata application information (ISO 19115-1)
Prerequisite	Requirements class 17: XML implementation of metadata extension information (ISO 19115-1)
Statement	The XML instance shall import and be valid according to the <code>mda</code> schema.

Table 74 — Requirements class 7: XML implementation of metadata basic information (ISO 19115-1)

Identifier	https://standards.iso211.org/19115/-1/1/req/metadata-xml/basic
Conformance class	Conformance class A.7: Validation of XML instance for metadata basic information (ISO 19115-1)
Implements	Requirement 1: Metadata basic data requirements
XML prefix	<code>mdb</code> (abbreviation of “MetaData Base”)
XML name-space	https://schemas.iso211.org/19115/-1/mdb/1.3
XML description	Define metadata root element and properties, with abstract implementation. This name-space is intended to support profile development.
Description	XML implementation of metadata basic information.
Provisions	Requirement 35: Valid metadata basic instance Requirement 36: Identification of metadata base instance Requirement 37: Identification of upper-level object if exists Requirement 38: Language of metadata base instance Requirement 39: Character encoding of metadata base instance Requirement 40: Scope name of metadata base instance

Table 75 — Requirement 35: Valid metadata basic instance

Identifier	https://standards.iso211.org/19115/-1/1/req/metadata-xml/basic/valid
Included in	Requirements class 7: XML implementation of metadata basic information (ISO 19115-1)
Prerequisites	Requirements class 22: XML implementation of common classes (ISO 19115-1) Requirements class 23: XML implementation of multilingual support (language localization) (ISO 19115-1)
Statement	The XML instance shall import and be valid according to the <code>mdb</code> schema.

Table 76 — Requirement 36: Identification of metadata base instance

Identifier	https://standards.iso211.org/19115/-1/1/req/metadata-xml/basic/identification
Included in	Requirements class 7: XML implementation of metadata basic information (ISO 19115-1)
Statement	A metadata instance shall have an identification element that is in the XML substitution group for abstract <code>mcc:Abstract_ResourceDescription</code> .

Table 77 — Requirement 37: Identification of upper-level object if this exists

Identifier	https://standards.iso211.org/19115/-1/1/req/metadata-xml/basic/parent-metadata
Included in	Requirements class 7: XML implementation of metadata basic information (ISO 19115-1)
Statement	If an upper-level object to an instance of MD_Metadata exists, the MD_Metadata property “parent-Metadata” shall be provided.

Table 78 — Requirement 38: Language of metadata base instance

Identifier	https://standards.iso211.org/19115/-1/1/req/metadata-xml/basic/language
Included in	Requirements class 7: XML implementation of metadata basic information (ISO 19115-1)
Statement	If the language of the metadata content is not the defined default value (English, see 10.8), then a value shall be provided for <code>defaultLocale.PT_Locale.language</code> property consistent with the language content of the metadata instance.

Table 79 — Requirement 39: Character encoding of metadata base instance

Identifier	https://standards.iso211.org/19115/-1/1/req/metadata-xml/basic/character-encoding
Included in	Requirements class 7: XML implementation of metadata basic information (ISO 19115-1)
Statement	If the character encoding of the metadata content is not the defined default value (UTF-8, see 10.8), then a value shall be provided for <code>defaultLocale.PT_Locale.characterEncoding</code> property consistent with the character encoding of the metadata instance.

Table 80 — Requirement 40: Scope name of metadata base instance

Identifier	https://standards.iso211.org/19115/-1/1/req/metadata-xml/basic/metadata-scope-name
Included in	Requirements class 7: XML implementation of metadata basic information (ISO 19115-1)
Statement	If an MD_MetadataScope element is present, the name property shall have a value if MD_MetadataScope.resourceScope.MD_ScopeCode is not equal to “dataset”.

Table 81 — Requirements class 8: XML implementation of identification information (ISO 19115-1)

Identifier	https://standards.iso211.org/19115/-1/1/req/metadata-xml/identification
Conformance class	Conformance class A.8: Validation of XML instance for identification information (ISO 19115-1)
Implements	Requirement 3: Identification information data requirements
XML prefix	mri (abbreviation of “Metadata for Resource Identification”)
XML namespace	https://schemas.iso211.org/19115/-1/mri/1.3
XML description	Descriptive information about the resource.
Description	XML implementation of identification information.

Table 81 (continued)

Provisions	Requirement 41: Valid identification instance
	Requirement 42: Title of resource identification instance
	Requirement 43: Abstract of resource identification instance
	Requirement 44: Provides geographic extent of dataset
	Requirement 45: Topic category of resource identification instance
	Requirement 46: Associated resource of resource identification instance
	Requirement 47: Value of MD_RepresentativeFraction property “denominator”

Table 82 — Requirement 41: Valid identification instance

Identifier	https://standards.iso211.org/19115/-1/1/req/metadata-xml/identification/valid
Included in	Requirements class 8: XML implementation of identification information (ISO 19115-1)
Prerequisites	Requirements class 22: XML implementation of common classes (ISO 19115-1)
	Requirements class 21: XML implementation of citation, responsibility and party information (ISO 19115-1)
	Requirements class 26: XML implementation of GML wrapper (ISO 19136)
Statement	The XML instance shall import and be valid according to the <code>mri</code> schema.
Guidance	If the resource described by a metadata instance contains textual information, then a value should be provided for <code>MD_DataIdentification.defaultLocale</code> .

Table 83 — Requirement 42: Title of resource identification instance

Identifier	https://standards.iso211.org/19115/-1/1/req/metadata-xml/identification/citation
Included in	Requirements class 8: XML implementation of identification information (ISO 19115-1)
Prerequisite	Requirements class 21: XML implementation of citation, responsibility and party information (ISO 19115-1)
Statement	A resource identification instance shall provide a valid <code>CI_Citation</code> instance for <code>MD_Metadata.identificationInfo.MD_Identification.citation</code> , which requires the <code>CI_Citation.title</code> property to be set to a character string.

Table 84 — Requirement 43: Abstract of resource identification instance

Identifier	https://standards.iso211.org/19115/-1/1/req/metadata-xml/identification/abstract
Included in	Requirements class 8: XML implementation of identification information (ISO 19115-1)
Statement	A resource identification instance shall provide an “abstract” property value that is a character string, realized in <code>MD_Metadata.identificationInfo.MD_Identification.abstract</code> where <code>MD_Identification</code> is implemented by <code>mri:MD_DataIdentification</code> or <code>srv:SV_ServiceIdentification</code> .

Table 85 — Requirement 44: Provides geographic extent of dataset

Identifier	https://standards.iso211.org/19115/-1/1/req/metadata-xml/identification/dataset-extent
Included in	Requirements class 8: XML implementation of identification information (ISO 19115-1)
Statement	If the value of MD_Metadata.metadataScope.MD_MetadataScope.resourceScope property is “dataset”, then a geographic extent shall be provided, where the value of MD_Metadata.identificationInfo.MD_DataIdentification.extent shall be either an instance of EX_GeographicBoundingBox or EX_GeographicDescription.

Table 86 — Requirement 45: Topic category of resource identification instance

Identifier	https://standards.iso211.org/19115/-1/1/req/metadata-xml/identification/topic-category
Included in	Requirements class 8: XML implementation of identification information (ISO 19115-1)
Statement	If no value for the MD_Metadata.metadataScope property is provided, or if the value of MD_Metadata.metadataScope.MD_MetadataScope.resourceScope property is equal to “dataset” or equal to “series”, MD_Metadata.identificationInfo.MD_DataIdentification.topicCategory shall be provided.

Table 87 — Requirement 46: Associated resource of resource identification instance

Identifier	https://standards.iso211.org/19115/-1/1/req/metadata-xml/identification/associated-resource
Included in	Requirements class 8: XML implementation of identification information (ISO 19115-1)
Statement	If an MD_AssociatedResource element is instantiated, then a value for either the “name” or “metadataReference” property shall be provided.

Table 88 — Requirement 47: Value of MD_RepresentativeFraction property “denominator”

Identifier	https://standards.iso211.org/19115/-1/1/req/metadata-xml/identification/representative-fraction-denominator
Included in	Requirements class 8: XML implementation of identification information (ISO 19115-1)
Statement	If an MD_RepresentativeFraction element is instantiated, its property “denominator” shall have a value greater than 0.

Table 89 — Requirements class 9: XML implementation of constraint information (ISO 19115-1)

Identifier	https://standards.iso211.org/19115/-1/1/req/metadata-xml/constraints
Conformance class	Conformance class A.9: Validation of XML instance for constraint information (ISO 19115-1)
Implements	Requirement 4: Constraint information data requirements
XML prefix	mco (abbreviation of “Metadata for COntstraints”)
XML namespace	https://schemas.iso211.org/19115/-1/mco/1.3
XML description	Specify constraints on access and use.
Description	XML implementation of constraint information.
Provisions	Requirement 48: Valid constraint instance Requirement 49: Legal constraints of constraints instance Requirement 50: Other restrictions of constraints instance Requirement 51: Releasability of constraints instance

Table 90 — Requirement 48: Valid constraint instance

Identifier	https://standards.iso211.org/19115/-1/1/req/metadata-xml/constraints/valid
Included in	Requirements class 9: XML implementation of constraint information (ISO 19115-1)
Prerequisites	Requirements class 22: XML implementation of common classes (ISO 19115-1) Requirements class 21: XML implementation of citation, responsibility and party information (ISO 19115-1)
Statement	The XML instance shall import and be valid according to the <code>mco</code> schema.

Table 91 — Requirement 49: Legal constraints of constraints instance

Identifier	https://standards.iso211.org/19115/-1/1/req/metadata-xml/constraints/legal-constraints
Included in	Requirements class 9: XML implementation of constraint information (ISO 19115-1)
Statement	If an <code>MD_LegalConstraint</code> element is instantiated, then it shall have a property value for at least one of <code>accessConstraints</code> , <code>useConstraints</code> , <code>otherConstraints</code> , <code>useLimitation</code> , or <code>releasability</code> .

Table 92 — Requirement 50: Other restrictions of constraints instance

Identifier	https://standards.iso211.org/19115/-1/1/req/metadata-xml/constraints/other-restrictions
Included in	Requirements class 9: XML implementation of constraint information (ISO 19115-1)
Statement	A value may be provided for the <code>otherConstraints</code> property only if the code value of an <code>accessConstraints</code> or <code>useConstraints</code> property is equal to “otherRestrictions”.

Table 93 — Requirement 51: Releasability of constraints instance

Identifier	https://standards.iso211.org/19115/-1/1/req/metadata-xml/constraints/releasability
Included in	Requirements class 9: XML implementation of constraint information (ISO 19115-1)
Statement	If an <code>MD_Releasability</code> element is instantiated, then it shall have a property value for at least one of “addressee” or “statement”.

Table 94 — Requirements class 10: XML implementation of resource lineage information (ISO 19115-1)

Identifier	https://standards.iso211.org/19115/-1/1/req/metadata-xml/lineage
Conformance class	Conformance class A.10: Validation of XML instance for resource lineage information (ISO 19115-1)
Implements	Requirement 5: Lineage information data requirements Requirement 22: Extended lineage information data requirements
XML prefix	<code>mrl</code> (abbreviation of “Metadata for Resource Lineage”)
XML namespace	https://schemas.iso211.org/19115/-1/mrl/1.3
XML description	Resource provenance
Description	XML implementation of resource lineage information
Provisions	Requirement 52: Valid application schema instance Requirement 53: Lineage content of lineage instance Requirement 54: Source of lineage instance

Table 95 — Requirement 52: Valid application schema instance

Identifier	https://standards.iso2c211.org/19115/-1/1/req/metadata-xml/lineage/valid
Included in	Requirements class 10: XML implementation of resource lineage information (ISO 19115-1)
Prerequisites	Requirements class 21: XML implementation of citation, responsibility and party information (ISO 19115-1) Requirements class 22: XML implementation of common classes (ISO 19115-1) Requirements class 26: XML implementation of GML wrapper (ISO 19136)
Statement	The XML instance shall import and be valid according to the <code>mrl</code> schema.

Table 96 — Requirement 53: Lineage content of lineage instance

Identifier	https://standards.iso/211.org/19115/-1/1/req/metadata-xml/lineage/lineage-content
Included in	Requirements class 10: XML implementation of resource lineage information (ISO 19115-1)
Statement	If a LI_Lineage element is instantiated and no value is provided for the LI_Lineage.statement property, then at least one of “processStep” or “source” shall have a value.

Table 97 — Requirement 54: Source of lineage instance

Identifier	https://standards.iso/211.org/19115/-1/1/req/metadata-xml/lineage/source
Included in	Requirements class 10: XML implementation of resource lineage information (ISO 19115-1)
Statement	If an LI_Source element is instantiated, then either the “description” or “scope” property shall have a value.

Table 98 — Requirements class 11: XML implementation of maintenance information (ISO 19115-1)

Identifier	https://standards.iso211.org/19115/-1/1/req/metadata-xml/maintenance
Conformance class	Conformance class A.11: Validation of XML instance for maintenance information (ISO 19115-1)
Implements	Requirement 6: Maintenance information data requirements
XML prefix	mmi (abbreviation of “Metadata for Maintenance Information”)
XML namespace	https://schemas.iso211.org/19115/-1/mmi/1.3
XML description	Maintenance of resources and metadata.
Description	XML implementation of maintenance information.
Provisions	Requirement 55: Valid maintenance information instance Requirement 56: Frequency of maintenance information instance

Table 99 — Requirement 55: Valid maintenance information instance

Identifier	https://standards.iso2c211.org/19115/-1/1/req/metadata-xml/maintenance/valid
Included in	Requirements class 11: XML implementation of maintenance information (ISO 19115-1)
Statement	The XML instance shall import and be valid according to the <code>mmi</code> schema.

Table 100 — Requirement 56: Frequency of maintenance information instance

Identifier	https://standards.iso211.org/19115/-1/1/req/metadata-xml/maintenance/frequency
Included in	Requirements class 11: XML implementation of maintenance information (ISO 19115-1)
Statement	If an MD_MaintenanceInformation element is instantiated, then a value for either the maintenanceAndUpdateFrequency or userDefinedMaintenanceFrequency property shall be present.

Table 101 — Requirements class 12: XML implementation of spatial representation information (ISO 19115-1)

Identifier	https://standards.iso211.org/19115/-1/1/req/metadata-xml/spatial-representation
Conformance class	Conformance class A.12: Validation of XML instance for spatial representation information (ISO 19115-1)
Implements	Requirement 7: Spatial representation information data requirements
XML prefix	msr (abbreviation of “Metadata for Spatial Representation”)
XML namespace	https://schemas.iso211.org/19115/-1/msr/1.3
XML description	Encoding of location information in resource content.
Description	XML implementation of spatial representation information.
Provisions	Requirement 57: Valid spatial representation instance Requirement 58: MD_Georectified with “checkPointAvailability” property provides description Requirement 59: Valid value for MD_GeometricObjects property “geometricObjectsCount”

Table 102 — Requirement 57: Valid spatial representation instance

Identifier	https://standards.iso211.org/19115/-1/1/req/metadata-xml/spatial-representation/valid
Included in	Requirements class 12: XML implementation of spatial representation information (ISO 19115-1)
Prerequisites	Requirements class 21: XML implementation of citation, responsibility and party information (ISO 19115-1) Requirements class 22: XML implementation of common classes (ISO 19115-1) Requirements class 26: XML implementation of GML wrapper (ISO 19136)
Statement	The XML instance shall import and be valid according to the msr schema.
Guidance	If the “checkPointAvailability” property has a value of “true” (1), then a value should be provided for the ‘checkPointDescription’ property.

Table 103 — Requirement 58: MD_Georectified with “checkPointAvailability” property provides description

Identifier	https://standards.iso211.org/19115/-1/1/req/metadata-xml/spatial-representation/georectified-check-point-description-value
Included in	Requirements class 12: XML implementation of spatial representation information (ISO 19115-1)
Statement	If the MD_Georectified element is instantiated and has the property “checkPointAvailability” set to a value of 1, the property of “checkPointDescription” shall be set.

Table 104 — Requirement 59: Valid value for MD_GeometricObjects property “geometricObjectsCount”

Identifier	https://standards.iso211.org/19115/-1/1/req/metadata-xml/spatial-representation/geometric-object-count-value
Included in	Requirements class 12: XML implementation of spatial representation information (ISO 19115-1)
Statement	If the MD_GeometricObjects element is instantiated and has the property “geometricObjectsCount”, its value shall be greater than 0.

Table 105 — Requirements class 13: XML implementation of reference system information (ISO 19115-1)

Identifier	https://standards.iso211.org/19115/-1/1/req/metadata-xml/reference-system
Conformance class	Conformance class A.13: Validation of XML instance for reference system information (ISO 19115-1)
Implements	Requirement 8: Reference system information data requirements
XML prefix	mrs (abbreviation of “Metadata for Reference System”)
XML namespace	https://schemas.iso211.org/19115/-1/mrs/1.3
XML description	Spatial reference system for resource content.
Description	XML implementation of reference system information
Provisions	Requirement 60: Valid application schema instance Requirement 61: Valid MD_ReferenceSystem with identification properties Requirement 62: Valid MD_ReferenceSystem with property “crs” and CRS is dynamic

Table 106 — Requirement 60: Valid application schema instance

Identifier	https://standards.iso211.org/19115/-1/1/req/metadata-xml/reference-system/valid
Included in	Requirements class 13: XML implementation of reference system information (ISO 19115-1)
Prerequisite	Requirements class 22: XML implementation of common classes (ISO 19115-1)
Statement	The XML instance shall import and be valid according to the mrs schema.

Table 107 — Requirement 61: Valid MD_ReferenceSystem with identification properties

Identifier	https://standards.iso211.org/19115/-1/1/req/metadata-xml/reference-system/identifier
Included in	Requirements class 13: XML implementation of reference system information (ISO 19115-1)
Statement	If the MD_ReferenceSystem element is instantiated, it shall have at least one of the properties “referenceSystemIdentifier” or “crs” set.
Guidance	The property of “crs” was introduced in ISO 19115-1:2014/Amd 2:2020, 6.5.8.

Table 108 — Requirement 62: Valid MD_ReferenceSystem with property “crs” and CRS is dynamic

Identifier	https://standards.iso211.org/19115/-1/1/req/metadata-xml/reference-system/coordinate-epoch
Included in	Requirements class 13: XML implementation of reference system information (ISO 19115-1)
Statement	If the MD_ReferenceSystem element is instantiated and has the property “crs” set, the property “coordinateEpoch” shall be set.
Guidance	The property of “coordinateEpoch” was introduced in ISO 19115-1:2014/Amd 2:2020, 6.5.8.

Table 109 — Requirements class 14: XML implementation of content information (ISO 19115-1)

Identifier	https://standards.iso/19115-3:2023/1/1/req/metadata-xml/content
Conformance class	Conformance class A.14: Validation of XML instance for content information (ISO 19115-1)
Implements	Requirement 9: Content information data requirements
XML prefix	mrc (abbreviation of “Metadata for Resource Content”)
XML namespace	https://schemas.isotc211.org/19115/-1/mrc/1.3
XML description	Resource data structure and content
Description	XML implementation of content information
Provisions	Requirement 63: Valid content instance Requirement 64: Feature catalogue of resource content instance Requirement 65: Inline feature catalogue of resource content instance Requirement 66: Value of MD_ImageDescription property “illuminationElevationAngle” Requirement 67: Value of MD_ImageDescription property “illuminationAzimuthAngle” Requirement 68: Value of MD_ImageDescription property “cloudCoverPercent” Requirement 69: Value of MD_SampleDimension property “units” Requirement 70: Value of MD_Band property “units” Requirement 71: Value of MD_FeatureTypeInfo property “featureInstanceCount”

Table 110 — Requirement 63: Valid content instance

Identifier	https://standards.iso/19115-3:2023/1/1/req/metadata-xml/content/valid
Included in	Requirements class 14: XML implementation of content information (ISO 19115-1)
Prerequisites	Requirements class 21: XML implementation of citation, responsibility and party information (ISO 19115-1) Requirements class 22: XML implementation of common classes (ISO 19115-1) Requirements class 23: XML implementation of multilingual support (language localization) (ISO 19115-1) Requirements class 26: XML implementation of GML wrapper (ISO 19136)
Statement	The XML instance shall import and be valid according to the <code>mrc</code> schema.

Table 111 — Requirement 64: Feature catalogue of resource content instance

Identifier	https://standards.iso/19115-3:2023/1/1/req/metadata-xml/content/feature-catalogue
Included in	Requirements class 14: XML implementation of content information (ISO 19115-1)
Statement	If an MD_FeatureCatalogueDescription is instantiated, then either the value for includedWithDataset shall be “true”, or a well-formed and valid MD_FeatureCatalogue instance shall be included in the metadata record, or a value shall be provided for the MD_FeatureCatalogueDescription.featureCatalogueCitation property.

Table 112 — Requirement 65: Inline feature catalogue of resource content instance

Identifier	https://standards.iso211.org/19115/-1/1/req/metadata-xml/content/inline-feature-catalogue
Included in	Requirements class 14: XML implementation of content information (ISO 19115-1)
Statement	If an MD_FeatureCatalogue instance is included with inline “featureCatalogue” property content, the namespace for the XML schema that implements an ISO 19110:2016 feature catalogue shall be declared in the instance document. A valid xsi:schemaLocation shall be provided that will retrieve an xml schema to validate the feature catalogue instance.

Table 113 — Requirement 66: Value of MD_ImageDescription property “illuminationElevationAngle”

Identifier	https://standards.iso211.org/19115/-1/1/req/metadata-xml/content/image-illumination-elevation-angle-value
Included in	Requirements class 14: XML implementation of content information (ISO 19115-1)
Statement	If an MD_ImageDescription element is instantiated and has the property “illuminationElevationAngle”, the value of which shall be in the range -90 to +90.

Table 114 — Requirement 67: Value of MD_ImageDescription property “illuminationAzimuthAngle”

Identifier	https://standards.iso211.org/19115/-1/1/req/metadata-xml/content/image-illumination-azimuth-angle-value
Included in	Requirements class 14: XML implementation of content information (ISO 19115-1)
Statement	If an MD_ImageDescription element is instantiated and has the property “illuminationAzimuthAngle”, the value of which shall be in the range 0 to 360.

Table 115 — Requirement 68: Value of MD_ImageDescription property “cloudCoverPercent”

Identifier	https://standards.iso211.org/19115/-1/1/req/metadata-xml/content/image-cloud-cover-percent-value
Included in	Requirements class 14: XML implementation of content information (ISO 19115-1)
Statement	If an MD_ImageDescription element is instantiated and has the property “cloudCoverPercent”, the value of which shall be in the range 0,0 to 100,0.

Table 116 — Requirement 69: Value of MD_SampleDimension property “units”

Identifier	https://standards.iso211.org/19115/-1/1/req/metadata-xml/content/dimension-units
Included in	Requirements class 14: XML implementation of content information (ISO 19115-1)
Statement	If an MD_SampleDimension element is instantiated and at least one of the “maxValue”, “minValue”, or “meanValue” properties has a value, then a value shall be provided for the “units” property.

Table 117 — Requirement 70: Value of MD_Band property “units”

Identifier	https://standards.iso211.org/19115/-1/1/req/metadata-xml/content/band-units-value
Included in	Requirements class 14: XML implementation of content information (ISO 19115-1)
Statement	If an MD_Band element is instantiated, the value of the “units” property at the superclass MD_SampleDimension shall be restricted to UomLength.
Guidance	UomLength is described in ISO 19103:2015.

Table 118 — Requirement 71: Value of MD_FeatureTypeInfo property “featureInstanceCount”

Identifier	https://standards.iso211.org/19115/-1/1/req/metadata-xml/content/feature-type-instance-count
Included in	Requirements class 14: XML implementation of content information (ISO 19115-1)
Statement	If MD_FeatureTypeInfo element is instantiated and has the “featureInstanceCount” property, the value shall be greater than 0.

Table 119 — Requirements class 15: XML implementation of portrayal catalogue information (ISO 19115-1)

Identifier	https://standards.iso211.org/19115/-1/1/req/metadata-xml/portrayal-catalogue
Conformance class	Conformance class A.15: Validation of XML instance for portrayal catalogue information (ISO 19115-1)
Implements	Requirement 10: Portrayal catalogue information data requirements
XML prefix	mpc (abbreviation of “Metadata for Portrayal Catalogue”)
XML namespace	https://schemas.iso211.org/19115/-1/mpc/1.3
XML description	Portrayal of described resource.
Description	XML implementation of portrayal catalogue information.
Provision	Requirement 72: Valid portrayal catalogue instance

Table 120 — Requirement 72: Valid portrayal catalogue instance

Identifier	https://standards.iso211.org/19115/-1/1/req/metadata-xml/portrayal-catalogue/valid
Included in	Requirements class 15: XML implementation of portrayal catalogue information (ISO 19115-1)
Prerequisites	Requirements class 21: XML implementation of citation, responsibility and party information (ISO 19115-1) Requirements class 22: XML implementation of common classes (ISO 19115-1)
Statement	The XML instance shall import and be valid according to the mpc schema.

Table 121 — Requirements class 16: XML implementation of distribution information (ISO 19115-1)

Identifier	https://standards.iso211.org/19115/-1/1/req/metadata-xml/distribution
Conformance class	Conformance class A.16: Validation of XML instance for distribution information (ISO 19115-1)
Implements	Requirement 11: Distribution information data requirements
XML prefix	mrd (abbreviation of “Metadata for Resource Distribution”)
XML namespace	https://schemas.iso211.org/19115/-1/mrd/1.3
XML description	How a resource is distributed.
Description	XML implementation of distribution information.
Provisions	Requirement 73: Valid distribution instance Requirement 74: Existence of MD_Medium densityUnits if density property is present Requirement 75: Valid transferSize value of MD_DigitalTransferOption Requirement 76: Valid MD_Medium density value Requirement 77: Valid MD_Medium volumes value

Table 122 — Requirement 73: Valid distribution instance

Identifier	https://standards.iso/19115-3/1/1/req/metadata-xml/distribution/valid
Included in	Requirements class 16: XML implementation of distribution information (ISO 19115-1)
Prerequisites	Requirements class 21: XML implementation of citation, responsibility and party information (ISO 19115-1) Requirements class 22: XML implementation of common classes (ISO 19115-1) Requirements class 20: XML implementation of extent information (ISO 19115-1) Requirements class 26: XML implementation of GML wrapper (ISO 19136)
Statement	The XML instance shall import and be valid according to the <code>mrd</code> schema.

Table 123 — Requirement 74: Existence of MD_Medium densityUnits if density property is present

Identifier	https://standards.iso/19115-3/1/1/req/metadata-xml/distribution/density-units
Included in	Requirements class 16: XML implementation of distribution information (ISO 19115-1)
Statement	If an MD_Medium element is instantiated and a value for the <code>density</code> property is present, then a value for the <code>densityUnits</code> property shall be provided.

Table 124 — Requirement 75: Valid transferSize value of MD_DigitalTransferOption

Identifier	https://standards.iso/19115-3/1/1/req/metadata-xml/distribution/transfer-option-size-value
Included in	Requirements class 16: XML implementation of distribution information (ISO 19115-1)
Statement	If an MD_DigitalTransferOption provides the “transferSize” property, the value is greater than 0,0.

Table 125 — Requirement 76: Valid MD_Medium density value

Identifier	https://standards.iso/19115-3/1/1/req/metadata-xml/distribution/density-value
Included in	Requirements class 16: XML implementation of distribution information (ISO 19115-1)
Statement	If an MD_Medium element is instantiated and a value for the <code>density</code> property is present, the value is greater than 0,0.

Table 126 — Requirement 77: Valid MD_Medium volumes value

Identifier	https://standards.iso/19115-3/1/1/req/metadata-xml/distribution/volumes-value
Included in	Requirements class 16: XML implementation of distribution information (ISO 19115-1)
Statement	If an MD_Medium element is instantiated and a value for the “volumes” property is present, the value is greater than 0.

Table 127 — Requirements class 17: XML implementation of metadata extension information (ISO 19115-1)

Identifier	https://standards.iso/19115-3/1/1/req/metadata-xml/metadata-extension
Conformance class	Conformance class A.17: Validation of XML instance for metadata extension information (ISO 19115-1)
Implements	Requirement 12: Metadata extension information data requirements

Table 127 (continued)

XML prefix	mex (abbreviation of “Metadata for EXtension”)
XML namespace	https://schemas.isotc211.org/19115/-1/mex/1.3
XML description	Extensions to metadata content.
Description	XML implementation of metadata extension information.
Provisions	Requirement 78: Valid application schema instance Requirement 79: Cardinality of metadata extension instance Requirement 80: Conditional condition of metadata extension instance Requirement 81: Mandatory code of metadata extension instance Requirement 82: Concept name of metadata extension instance Requirement 83: Proscribed name of metadata extension instance

Table 128 — Requirement 78: Valid application schema instance

Identifier	https://standards.isotc211.org/19115/-1/1/req/metadata-xml/metadata-extension/valid
Included in	Requirements class 17: XML implementation of metadata extension information (ISO 19115-1)
Prerequisites	Requirements class 21: XML implementation of citation, responsibility and party information (ISO 19115-1) Requirements class 22: XML implementation of common classes (ISO 19115-1)
Statement	The XML instance shall import and be valid according to the mex schema.

Table 129 — Requirement 79: Cardinality of metadata extension instance

Identifier	https://standards.isotc211.org/19115/-1/1/req/metadata-xml/metadata-extension/cardinality
Included in	Requirements class 17: XML implementation of metadata extension information (ISO 19115-1)
Statement	Values for the obligation, maximumOccurrence and domainValue properties in instances of MD_Extended-ElementInformation shall be provided, except when the dataType property code value is one of (codelist, enumeration, codelistElement).

Table 130 — Requirement 80: Conditional condition of metadata extension instance

Identifier	https://standards.isotc211.org/19115/-1/1/req/metadata-xml/metadata-extension/conditional-condition
Included in	Requirements class 17: XML implementation of metadata extension information (ISO 19115-1)
Statement	A value for the condition property shall be provided when the code value of the obligation property is equal to “conditional”.

Table 131 — Requirement 81: Mandatory code of metadata extension instance

Identifier	https://standards.isotc211.org/19115/-1/1/req/metadata-xml/metadata-extension/code-mandatory
Included in	Requirements class 17: XML implementation of metadata extension information (ISO 19115-1)
Statement	If the code value of the ‘dataType’ property is one of (codelist, enumeration, codelistElement), then a value shall be provided for the “code” property.

Table 132 — Requirement 82: Concept name of metadata extension instance

Identifier	https://standards.iso211.org/19115/-1/1/req/metadata-xml/metadata-extension/conceptname-mandatory
Included in	Requirements class 17: XML implementation of metadata extension information (ISO 19115-1)
Statement	If the code value of the dataType property is one of (codelist, enumeration, codelistElement), then a value shall be provided for the conceptName property.

Table 133 — Requirement 83: Proscribed name of metadata extension instance

Identifier	https://standards.iso211.org/19115/-1/1/req/metadata-xml/metadata-extension/name-proscribed
Included in	Requirements class 17: XML implementation of metadata extension information (ISO 19115-1)
Statement	If the code value of the dataType property is one of (codelist, enumeration, codelistElement) the name property shall be a nil value with a nilReason = "notApplicable" attribute value.

Table 134 — Requirements class 18: XML implementation of application schema information (ISO 19115-1)

Identifier	https://standards.iso211.org/19115/-1/1/req/metadata-xml/application-schema
Conformance class	Conformance class A.18: Validation of XML instance for application schema information (ISO 19115-1)
Implements	Requirement 13: Application schema information data requirements
XML prefix	mas (abbreviation of "Metadata for Application Schema")
XML namespace	https://schemas.iso211.org/19115/-1/mas/1.3
XML description	Application schema used to build a dataset.
Description	XML implementation of application schema information.
Provision	Requirement 84: Valid application schema instance

Table 135 — Requirement 84: Valid application schema instance

Identifier	https://standards.iso211.org/19115/-1/1/req/metadata-xml/application-schema/valid
Included in	Requirements class 18: XML implementation of application schema information (ISO 19115-1)
Prerequisites	Requirements class 21: XML implementation of citation, responsibility and party information (ISO 19115-1) Requirements class 22: XML implementation of common classes (ISO 19115-1)
Statement	The XML instance shall import and be valid according to the mas schema.

Table 136 — Requirements class 19: XML implementation of service metadata information (ISO 19115-1)

Identifier	https://standards.iso211.org/19115/-1/1/req/metadata-xml/service-metadata
Conformance class	Conformance class A.19: Validation of XML instance for service metadata information (ISO 19115-1)
Implements	Requirement 14: Service metadata information data requirements
XML prefix	srv (abbreviation of "SeRVice metadata")
XML namespace	https://schemas.iso211.org/19115/-1/srv/1.3
XML description	Information specific to service resources.

Table 136 (continued)

Description	XML implementation of service metadata information.
Provisions	Requirement 85: Valid service metadata instance Requirement 86: Chain or operation of service metadata instance Requirement 87: Coupling type of service metadata instance Requirement 88: Operation state of service metadata instance Requirement 89: Coupled resource definition of service metadata instance Requirement 90: Coupled resource linkage of service metadata instance Requirement 91: Provides service type
Guidance	If the value of MD_Metadata.metadataScope.MD_MetadataScope.resourceScope.MD_ScopeCode property is equal to “service”, then one instance of MD_Keyword should have a “keyword” property value that is a term from the service taxonomy defined in ISO 19119:2005.

Table 137 — Requirement 85: Valid service metadata instance

Identifier	https://standards.iso211.org/19115/-1/1/req/metadata-xml/service-metadata/valid
Included in	Requirements class 19: XML implementation of service metadata information (ISO 19115-1)
Prerequisites	Requirements class 21: XML implementation of citation, responsibility and party information (ISO 19115-1) Requirements class 8: XML implementation of identification information (ISO 19115-1) Requirements class 16: XML implementation of distribution information (ISO 19115-1)
Statement	The XML instance shall import and be valid according to the <code>srv</code> schema.

Table 138 — Requirement 86: Chain or operation of service metadata instance

Identifier	https://standards.iso211.org/19115/-1/1/req/metadata-xml/service-metadata/chain-or-operation
Included in	Requirements class 19: XML implementation of service metadata information (ISO 19115-1)
Statement	SV_ServiceIdentification instance shall have a value for either the “containsChain” or the “containsOperation” property.

Table 139 — Requirement 87: Coupling type of service metadata instance

Identifier	https://standards.iso211.org/19115/-1/1/req/metadata-xml/service-metadata/coupled-resource-exists
Included in	Requirements class 19: XML implementation of service metadata information (ISO 19115-1)
Statement	If the “coupledResource” property has a value, then the “couplingType” property shall have a value.

Table 140 — Requirement 88: Operation state of service metadata instance

Identifier	https://standards.iso211.org/19115/-1/1/req/metadata-xml/service-metadata/operated-or-operates-on
Included in	Requirements class 19: XML implementation of service metadata information (ISO 19115-1)
Statement	An SV_ServiceIdentification instance shall not contain values for both the “operatesOn” and “operatedDataset” properties.

Table 141 — Requirement 89: Coupled resource definition of service metadata instance

Identifier	https://standards.iso211.org/19115/-1/1/req/metadata-xml/service-metadata/coupled-resource-defined
Included in	Requirements class 19: XML implementation of service metadata information (ISO 19115-1)
Statement	If an SV_CoupledResource element is instantiated, then either the “resourceReference” or the “resource” property shall have a value.

Table 142 — Requirement 90: Coupled resource linkage of service metadata instance

Identifier	https://standards.iso211.org/19115/-1/1/req/metadata-xml/service-metadata/coupled-resource-linkage
Included in	Requirements class 19: XML implementation of service metadata information (ISO 19115-1)
Statement	An SV_CoupledResource instance shall not contain values for both the “resource” and “resourceReference” properties.

Table 143 — Requirement 91: Provides service type

Identifier	https://standards.iso211.org/19115/-1/1/req/metadata-xml/service-metadata/service-type
Included in	Requirements class 19: XML implementation of service metadata information (ISO 19115-1)
Statement	An SV_ServiceIdentification instance shall provide the serviceType attribute in form of a GenericName.

Table 144 — Requirements class 20: XML implementation of extent information (ISO 19115-1)

Identifier	https://standards.iso211.org/19115/-1/1/req/metadata-xml/extent
Conformance class	Conformance class A.20: Validation of XML instance for extent information (ISO 19115-1)
Implements	Requirement 15: Extent information data requirements
XML prefix	gex (abbreviation of “Geospatial EXtent”)
XML namespace	https://schemas.iso211.org/19115/-1/gex/1.3
XML description	Elements for specifying geospatial properties of a resource, including extent and spatial reference systems.
Description	XML implementation of extent information.
Provisions	Requirement 92: Valid geospatial extent instance Requirement 93: Value required of geospatial extent instance Requirement 94: Values of EX_GeographicBoundingBox are valid Requirement 95: Vertical CRS presence in geospatial extent instance

Table 145 — Requirement 92: Valid geospatial extent instance

Identifier	https://standards.iso211.org/19115/-1/1/req/metadata-xml/extent/valid
Included in	Requirements class 20: XML implementation of extent information (ISO 19115-1)
Prerequisite	Requirements class 26: XML implementation of GML wrapper (ISO 19136)
Statement	The XML instance shall import and be valid according to the gex schema.

Table 146 — Requirement 93: Value required of geospatial extent instance

Identifier	https://standards.iso211.org/19115/-1/1/req/metadata-xml/extent/value-required
Included in	Requirements class 20: XML implementation of extent information (ISO 19115-1)
Statement	If an EX_Extent element is instantiated, then a value for either “description”, “geographicElement”, “temporalElement” or “verticalElement” shall be present.

Table 147 — Requirement 94: Values of EX_GeographicBoundingBox are valid

Identifier	https://standards.iso211.org/19115/-1/1/req/metadata-xml/extent/geographic-bounding-box
Included in	Requirements class 20: XML implementation of extent information (ISO 19115-1)
Statement	If an EX_GeographicBoundingBox element is instantiated, then the values of its attributes shall be valid. In particular: — westBoundingLongitude is in the range –180 to +180 — eastBoundingLongitude is in the range –180 to +180 — southBoundingLongitude is in the range –90 to +90 — northBoundingLongitude is in the range –90 to +90 — northBoundingLongitude is greater than southBoundingLongitude

Table 148 — Requirement 95: Vertical CRS presence in geospatial extent instance

Identifier	https://standards.iso211.org/19115/-1/1/req/metadata-xml/extent/vertical-crs
Included in	Requirements class 20: XML implementation of extent information (ISO 19115-1)
Statement	If an EX_VerticalExtent element is instantiated, then a value for either verticalCRSId or vertical-CRS shall be present.

Table 149 — Requirements class 21: XML implementation of citation, responsibility and party information (ISO 19115-1)

Identifier	https://standards.iso211.org/19115/-1/1/req/metadata-xml/citation
Conformance class	Conformance class A.21: Validation of XML instance for citation, responsibility and party information (ISO 19115-1)
Prerequisite	Requirements class 22: XML implementation of common classes (ISO 19115-1)
Implements	Requirement 16: Citation, responsibility and party information data requirements
XML prefix	cit (abbreviation of “CITation”)
XML namespace	https://schemas.iso211.org/19115/-1/cit/1.3
XML description	Elements for codelist catalogues, and example catalogues.
Description	XML implementation of citation, responsibility and party information.
Provisions	Requirement 96: Valid citation encoding Requirement 97: Valid values of CI_Individual Requirement 98: Valid values of CI_Organisation Requirement 99: Valid values of CI_OnlineResource

Table 150 — Requirement 96: Valid citation encoding

Identifier	https://standards.iso211.org/19115/-1/1/req/metadata-xml/citation/valid
Included in	Requirements class 21: XML implementation of citation, responsibility and party information (ISO 19115-1)
Statement	The XML instance shall import and be valid according to the <code>cit</code> schema.

Table 151 — Requirement 97: Valid values of CI_Individual

Identifier	https://standards.iso211.org/19115/-1/1/req/metadata-xml/citation/individual-name
Included in	Requirements class 21: XML implementation of citation, responsibility and party information (ISO 19115-1)
Statement	Any instance of CI_Individual shall have either a “name” property value or a “positionName” property value.

Table 152 — Requirement 98: Valid values of CI_Organisation

Identifier	https://standards.iso211.org/19115/-1/1/req/metadata-xml/citation/organisation-name
Included in	Requirements class 21: XML implementation of citation, responsibility and party information (ISO 19115-1)
Statement	Any instance of CI_Organisation shall have either a “name” property value or a “logo” property value.

Table 153 — Requirement 99: Valid values of CI_OnlineResource

Identifier	https://standards.iso211.org/19115/-1/1/req/metadata-xml/citation/online-resource
Included in	Requirements class 21: XML implementation of citation, responsibility and party information (ISO 19115-1)
Statement	Any instance of CI_OnlineResource shall set the “linkage” property value to a URL.

Table 154 — Requirements class 22: XML implementation of common classes (ISO 19115-1)

Identifier	https://standards.iso211.org/19115/-1/1/req/metadata-xml/common
Conformance class	Conformance class A.22: Validation of XML instance for common classes (ISO 19115-1)
Implements	Requirement 17: Commonly used classes data requirements
XML prefix	mcc (abbreviation of “Metadata for Common Classes”)
XML name-space	https://schemas.iso211.org/19115/-1/mcc/1.3
XML description	Elements used by all other packages.
Description	XML implementation of common classes.
Provision	Requirement 100: Valid common classes encoding
Guidance	There is a circular dependency between the citation and common classes packages, but because of the policy that the implementation package should match the base abstract schema (ISO 19115-1:2014) packaging, these are implemented as separate namespaces.

Table 155 — Requirement 100: Valid common classes encoding

Identifier	https://standards.iso211.org/19115/-1/1/req/metadata-xml/common/valid
Included in	Requirements class 22: XML implementation of common classes (ISO 19115-1)
Statement	The XML instance shall import and be valid according to the <code>mcc</code> schema.

Table 156 — Requirements class 23: XML implementation of multilingual support (language localization) (ISO 19115-1)

Identifier	https://standards.iso/19115-3:2023/req/metadata-xml/multilingual
Conformance class	Conformance class A.23: Validation of XML instance for multilingual support (language localization) (ISO 19115-1)
Implements	Requirement 18: Multilingual support data requirements
XML prefix	lan (abbreviation of “LANguage localization”)
XML namespace	https://schemas.iso/19115-3:2023/lan/1.3
XML description	Elements for cultural and linguistic adaptability.
Description	XML implementation of multilingual support (language localization).
Provisions	Requirement 101: Valid multilingual encoding Requirement 102: Language code from ISO 639-2 Requirement 103: Country code from ISO 3166-1 Requirement 104: Character set code from IANA charset register

Table 157 — Requirement 101: Valid multilingual encoding

Identifier	https://standards.iso/19115-3:2023/req/metadata-xml/multilingual/valid
Included in	Requirements class 23: XML implementation of multilingual support (language localization) (ISO 19115-1)
Prerequisite	Requirements class 21: XML implementation of citation, responsibility and party information (ISO 19115-1)
Statement	The XML instance shall import and be valid according to the lan schema.

Table 158 — Requirement 102: Language code from ISO 639-2

Identifier	https://standards.iso/19115-3:2023/req/metadata-xml/multilingual/language-code
Included in	Requirements class 23: XML implementation of multilingual support (language localization) (ISO 19115-1)
Statement	The value of PT_Locale.language.LanguageCode shall be from ISO 639-2.

Table 159 — Requirement 103: Country code from ISO 3166-1

Identifier	https://standards.iso/19115-3:2023/req/metadata-xml/multilingual/country-code
Included in	Requirements class 23: XML implementation of multilingual support (language localization) (ISO 19115-1)
Statement	The value of PT_Locale.country.CountryCode shall be from ISO 3166-1.

Table 160 — Requirement 104: Character set code from IANA charset register

Identifier	https://standards.iso/19115-3:2023/req/metadata-xml/multilingual/character-set-code
Included in	Requirements class 23: XML implementation of multilingual support (language localization) (ISO 19115-1)
Statement	The value of PT_Locale.characterEncoding.CharacterSetCode shall be from the IANA character-sets register.

8.5.3 Derived from ISO 19115-2

The metadata modules defined by this document, the clauses they implement and the requirements class for XML instance documents for each namespace module derived from ISO 19115-2, are described in [Table 161](#) and [Table 162](#).

Table 161 — Requirements class 24: XML implementation of acquisition information (ISO 19115-2)

Identifier	https://standards.iso211.org/19115/-2/2/req/metadata-xml/acquisition
Conformance class	Conformance class A.24: XML implementation of acquisition information (ISO 19115-2)
Implements	Requirement 21: Acquisition information data requirements
XML prefix	mac (abbreviation of “Metadata Acquisition information”)
XML namespace	https://schemas.iso211.org/19115/-2/mac/2.2
XML description	Elements for acquisition of spatial data.
Description	XML implementation of acquisition information.
Provision	Requirement 105: Valid acquisition encoding

Table 162 — Requirement 105: Valid acquisition encoding

Identifier	https://standards.iso211.org/19115/-2/2/req/metadata-xml/acquisition/valid
Included in	Requirements class 24: XML implementation of acquisition information (ISO 19115-2)
Prerequisite	Requirements class 26: XML implementation of GML wrapper (ISO 19136)
Statement	The XML instance shall be valid according to ISO 19115-2:2019, A.2.5.

8.5.4 Derived from standards outside of the ISO 19115 series

The requirements classes for XML instance documents for each namespace module derived from standards outside of the ISO 19115 series are described in [Table 163](#) to [Table 166](#).

Table 163 — Requirements class 25: XML implementation of extended base types (ISO 19103)

Identifier	https://standards.iso211.org/19115/-1/1/req/extended-types-xml
Conformance class	Conformance class A.25: XML package for Base Types Extended (ISO 19103)
XML prefix	gcx
XML namespace	https://schemas.iso211.org/19103/-/gcx/1.2
XML description	Extended base types.
Description	XML implementation of extended base types.
Provision	Requirement 106: Valid extended types encoding

Table 164 — Requirement 106: Valid extended types encoding

Identifier	https://standards.iso211.org/19115/-1/1/req/extended-types-xml/valid
Included in	Requirements class 25: XML implementation of extended base types (ISO 19103)
Statement	The XML instance shall import and be valid according to the gcx schema.

Table 165 — Requirements class 26: XML implementation of GML wrapper (ISO 19136)

Identifier	https://standards.iso211.org/19115/-1/1/req/gml-wrapper-xml
Conformance class	Conformance class A.26: XML package for GML Wrapper (ISO 19136)
XML prefix	gmw
XML namespace	https://schemas.isotc211.org/19136/-1/gmw/1.1
XML description	Wrapper for GML.
Description	XML implementation of GML wrapper.
Provision	Requirement 107: Valid GML wrapper

Table 166 — Requirement 107: Valid GML wrapper

Identifier	https://standards.iso211.org/19115/-1/1/req/gml-wrapper-xml/valid
Included in	Requirements class 26: XML implementation of GML wrapper (ISO 19136)
Statement	The XML instance shall import and be valid according to the gmw schema.

8.6 Requirements for extended metadata records

A metadata record as permitted by the ISO 19115-1:2014/Amd 1:2018, ISO 19115-1:2014/Amd 2:2020 and ISO 19115-2:2019/Amd 1:2022 can be extended following the rules specified in ISO/TS 19139-1:2019, Clause A.3 and Clause A.4.

Applications that conform to this class need to have a valid XML root element `mdb:MD_Metadata`, and be able to process information provided in the `MD_MetadataExtension` section of metadata instance documents.

The modular implementation defined in this document enables metadata extensions that substitute different concrete elements for one or more of the optional `MD_Metadata` properties that are implemented with abstract class property types. The `MD_MetadataExtensionInformation` content should be used in these cases to document the extended content.

Note that any profile that extends the base schema will need to include schema imports for the extension namespace, as well as any other components from this document that are needed, and will need to specify schema locations for the extension namespaces in all instance documents.

The requirements for extended metadata records are described in [Table 167](#) to [Table 174](#).

The corresponding conformance class is located in [A.3.5](#).

Table 167 — Requirements class 27: XML metadata instance with extended metadata content model (ISO 19115-1)

Identifier	https://standards.iso211.org/19115/-1/1/req/extended-metadata-xml
Conformance class	Conformance class A.27: Validation of XML metadata instance with extended content model (ISO 19115-1)
Prerequisites	Requirements class 4: Metadata information minimum interchange (ISO 19115-1) Requirements class 17: XML implementation of metadata extension information (ISO 19115-1)
Description	XML metadata instance with extended metadata content model.

Table 167 (continued)

Provisions	Requirement 108: Valid extended metadata encoding
	Requirement 109: Extension elements are namespaced
	Requirement 110: Extension elements supports validation
	Requirement 111: Codelists are implemented according to ISO 19139-1
	Requirement 112: New elements are implemented as subclasses
	Requirement 113: New elements include the <code>isoType</code> attribute
	Requirement 114: Validation process exists for restrictions asserted in a profile

Table 168 — Requirement 108: Valid extended metadata encoding

Identifier	https://standards.iso211.org/19115/-1/1/req/extended-metadata-xml/valid
Included in	Requirements class 27: XML metadata instance with extended metadata content model (ISO 19115-1)
Statement	An MD_Metadata XML instance that includes child elements not defined by this document shall include at least one MD_MetadataExtensionInformation element that is valid against the XML schema for the https://schemas.iso211.org/19115/-1/mex/1.3 namespace.

Table 169 — Requirement 109: Extension elements are namespaced

Identifier	https://standards.iso211.org/19115/-1/1/req/extended-metadata-xml/new-section
Included in	Requirements class 27: XML metadata instance with extended metadata content model (ISO 19115-1)
Statement	An MD_Metadata XML instance that includes child elements not defined by this document shall have those elements namespace-qualified with a namespace URI different from namespaces defined by this document.

Table 170 — Requirement 110: Extension elements supports validation

Identifier	https://standards.iso211.org/19115/-1/1/req/extended-metadata-xml/validation
Included in	Requirements class 27: XML metadata instance with extended metadata content model (ISO 19115-1)
Statement	An MD_Metadata XML instance that includes child elements not defined by this document shall support validation using an XML schema validation tool.

Table 171 — Requirement 111: Codelists are implemented according to ISO 19139-1

Identifier	https://standards.iso211.org/19115/-1/1/req/extended-metadata-xml/new-codelist
Included in	Requirements class 27: XML metadata instance with extended metadata content model (ISO 19115-1)
Statement	All codelists utilized in the extended metadata content shall be implemented according to the rules in ISO/TS 19139-1:2019, 7.3.5.

Table 172 — Requirement 112: New elements are implemented as subclasses

Identifier	https://standards.iso211.org/19115/-1/1/req/extended-metadata-xml/new-element
Included in	Requirements class 27: XML metadata instance with extended metadata content model (ISO 19115-1)
Statement	New XML elements utilized in the extended metadata content shall be implemented as subclasses of existing ISO geographic information standards classes following the guidelines in ISO/TS 19139-1:2019, 7.3.3.

Table 173 — Requirement 113: New elements include the isoType attribute

Identifier	https://standards.iso211.org/19115/-1/1/req/extended-metadata-xml/iso-type
Included in	Requirements class 27: XML metadata instance with extended metadata content model (ISO 19115-1)
Statement	New XML elements utilized in the extended metadata content shall include an isoType attribute with a value that is the name of an existing ISO geographic information standard class.

Table 174 — Requirement 114: Validation process exists for restrictions asserted in a profile

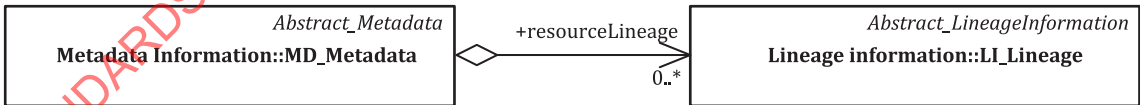
Identifier	https://standards.iso211.org/19115/-1/1/req/extended-metadata-xml/extension-by-restriction
Included in	Requirements class 27: XML metadata instance with extended metadata content model (ISO 19115-1)
Statement	Restrictions to element or attribute cardinality specified in ISO 19115-1 that are asserted in a metadata profile shall have an associated validation process specified by that profile.

9 Requirements dependency diagrams

Figure 4 shows dependencies between requirements classes for XML documents that instantiate elements from the namespaces defined in this document. The dependencies between requirements classes in the implementation model indicate that a dependent class (the source of the association) inherits all requirements from the class that is the target of the dependency relationship (the arrow points to the target class). Thus, all requirements classes inherit the core requirements.

Each of these requirements classes is associated with a conformance class that defines tests to determine that instance documents meet requirements specified. Note the addition of requirements classes that specify metadata records incorporating all the optional metadata content modules (full metadata record instance) and extensions to the metadata content model following the provisions of ISO 19115-1 and ISO 19115-2. These requirements classes do not require implementation of any new metadata elements.

Conformance classes for these requirements classes are implemented via XML schemas that have the same MD_Metadata root element, and import the necessary XML schema defined in the metadata module conformance classes (and external schema in some cases). The namespace URIs associated with these requirements classes are simply used as target namespace attribute values in the schema and instance documents to indicate conformance to that requirements class. The URI schema locations point to the XML schema used to validate conformance with a particular conformance class.



NOTE Arrows in the diagram imply that the requirements for a class at the source end of the arrow include all requirements included in the class at the target end of the arrow.

Figure 4 — Dependencies between encoding requirements classes

10 Design goals and implementation

10.1 Introduction to design goals and decisions

This clause describes the design decisions made in producing the schema in this document from the models in ISO 19115-1 and ISO 19115-2.

10.2 Automated generation of XML schema

A major design objective for ISO geographic information International Standard information models is to enable the production of XML schema following standard rules and implementation patterns such that machine processing of UML models can generate the XML schema. The intention is to promote predictability, extensibility, reuse of schema, and interoperability with other ISO geographic information standards implementations. The resulting XML schemas are algorithmically derived from the normative UML models for ISO geographic information International Standards, using the rules specified in ISO/TS 19139-1:2019. In that sense, this document conforms to ISO/TS 19139-1:2019. This promotes consistency in the resulting schemas. The resulting schemas are predictable since UML classes, attributes, associations, etc. are encoded following consistent rules and patterns.

Another requirement of this implementation is to modularize the encoding of ISO 19115-1 and ISO 19115-2 content by defining XML elements in several namespaces, with a minimum of dependencies between them (see [Clause 9](#)). The purpose of grouping XML elements into namespaces is to define loosely-coupled units of information representation capability that facilitate reuse in other applications. The contents of several XML namespaces are defined in this document, which may be reused by importing them into other XML schema. Use of an existing XML schema is advantageous because it reduces the amount of new schema development required, and because existing software can be available that can process model elements conforming to an existing XML schema. The ISO 19115-1 and ISO 19115-2 metadata conceptual schema is designed to support the transfer of resource documentation (metadata) among and within user communities.

10.3 Multilingual adaptability and polymorphism

Cultural and linguistic adaptability is a requirement for metadata elements with text content. ISO 19115-1:2014, Annex F contains an informative discussion of multilingual textual metadata elements. In order to enable the interoperability of multilingual instance documents, the XML implementation for this document follows the implementation specified in ISO/TS 19139-1:2019. The property type encodings described in ISO/TS 19139-1:2019, 7.2.3, enable extensions to the XML schema that implement property values using element types not included in the base XML schema.

Such polymorphism allows user communities to modify geographic metadata to meet their organizational needs. This pattern is used to provide cultural and linguistic adaptability support through metadata instance documents containing content in one or more languages that do not violate cardinality rules defined in ISO 19115-1 or ISO 19115-2. The lan namespace defines a CharacterString property type that includes a CharacterString value, and zero to many PT_FreeText elements, each of which is a language-localized character string that may be included inline or by reference. Using this extension, a single metadata document may include content strings in a variety of languages, but clients that are not programmed for multilingual content will still work because the standard CharacterString element is present.

Another example of polymorphism is the name attribute of type CharacterString in the CI_Individual class in ISO 19115-1; if a more structured representation is required (e.g. first, middle, and last name elements), polymorphism allows extension of the name element implementation in a user-defined namespace that may be substituted for CharacterString within a metadata instance. These extensions will be understandable to users who recognize the extension namespace, but in general such extensions will not interoperate with client software not designed to work with them.

10.4 Core decisions

By adopting the rules specified in ISO/TS 19139-1:2019, many of the requirements of the conceptual models in ISO 19115-1 and ISO 19115-2 are enforced by the XML schema which forms part of this document.

As described in ISO/TS 19139-1:2019, 7.2.3.3, not everything can be checked by XML schema. This document therefore also contains Schematron rules set to provide further checking.

EXAMPLE The application of <https://standards.iso.org/iso19139-1/1/req/default/XCPT> allows for inline content, content by reference, or a null value explanation. XML schema is unable to check that exactly one of the three occurs. This is checked by the Schematron rules.

10.5 Extensions to the UML models in the ISO geographic information series of International Standards for this schema

This implementation includes the model extensions defined in ISO/TS 19139-1 for web environment (geospatial common extended types), and cultural and linguistic adaptability. As some of the ISO/TS 19139-1:2019 extensions import elements from ISO 19103:2015, new XML implementations of these extensions have been placed into a directory associated with that document (<https://schemas.isotc211.org/19103/>). These new implementations are bundled in the geographic common objects (gco) and metadata common extension (gcx) namespaces

10.6 UML packages and XML namespaces

The procedure used to encode concepts from ISO 19115-1 and ISO 19115-2 into XML, described in ISO/TS 19139-1:2019, combined concepts from many UML packages into separate XML namespaces. The use of the namespaces used for implementations of ISO 19115-1 and ISO 19115-2 is briefly discussed in [Annex B](#).

Rules controlling the relationship between packages and namespaces used in this document are as follows:

- a) the XML implementation will include a minimum of one namespace per UML package in the conceptual model;
- b) UML packages can be split into multiple namespaces, if necessary, to ease the implementation and management of the life-cycles of various components.

10.7 UML model for XML implementation

ISO 19115-1 and ISO 19115-2 define a number of UML packages and relationships between them. These relationships result in dependencies between packages that make it impossible to reuse them without including the entire model. Abstract classes have been created to define substitution groups for classes that are used or can potentially be used by XML implementations of other ISO models. Abstract classes for linkage between namespaces are all packaged in a single package. The XML schema was generated automatically from the conceptual model according to rules defined in ISO 19118:2011 and ISO/TS 19139-1:2019.

10.8 Implementation approach for decoupling XML packages

10.8.1 General

The implementation approach uses abstract classes in property values that require elements from imported namespaces. Interchange documents import the base scheme, the abstract class package (which does not change between versions) and the schema that implements a concrete element in the substitution group for an abstract element. New versions of a particular namespace can derive new element definitions from that abstract class, allowing the new model to be used by importing the new namespace in instance documents. This requires no modification to the implementation of the base schema. This approach is explained in more detail in this subclause.

Associations between UML classes may be modelled as attribute values or association ends. The implementation approach defined here is required in cases where an optional attribute or association has a property type that is a class from a different package than the containing element. XML instance documents need to validate with or without importing the namespace that implements the optional

property type class. This is accomplished by using an abstract class for the property value type in the schema for the parent element (MD_Metadata in [Figure 4](#)) and a concrete substitute for that abstract class in the schema for the child (LI_Lineage in [Figure 4](#)) that provides the actual implementation of the property value class.

The pattern is illustrated in more detail in [Figure 5](#); XML implementation is shown in Example 1, Example 2, and Example 3. The MD_Metadata class is included in the metadata base (mdb) namespace, which imports the abstract Abstract_LineageInformation class from the Metadata for common classes (mcc) namespace. The mcc namespace is included in all conformance classes. The concrete implementation of the Abstract_LineageInformation class is the LI_Lineage class defined in the metadata for resource lineage (mrl) namespace. Conforming instance documents do not need to import the mrl namespace unless they actually include lineage information. Metadata for resource lineage (mrl) namespace does not need to import the metadata base (mdb) namespace to validate, allowing it to be used as a standalone module in other application schema that wish to associate provenance with some model element.

EXAMPLE 1 Association from base metadata class to abstract property type. The base class namespace (“mdb”) defines the base metadata element that has optional property to various metadata detail classes (see [Figure 4](#)). The base class imports the namespace that contains the shared abstract element definitions.

```
<import namespace="https://schemas.isotc211.org/19115/-1/mcc/1.3"
  schemaLocation="../../../mcc/3.1.0/mcc.xsd"/>
<!-- schema elements omitted-->
<!-- root entity which defines metadata about a resource or resources -->
<element name="MD_Metadata" substitutionGroup="gco:AbstractObject"
  type="mdb:MD_Metadata_Type"/>
<!-- type definition for root element, complex content is a sequence of properties-->
<complexType name="MD_Metadata_Type">
  <complexContent>
    <extension base="gco:AbstractObject_Type">
      <sequence>
        <!-- elements omitted...-->
        <element maxOccurs="unbounded" minOccurs="0" name="resourceLineage"
          type="<strong>"<em>mcc:Abstract_LineageInformation_PropertyType</em>"</>
strong>/>
        <!-- type for resourceLineage is an abstract class from mcc-->
        <!-- elements omitted...-->
      </sequence>
    </extension>
  </complexContent>
</complexType>
```

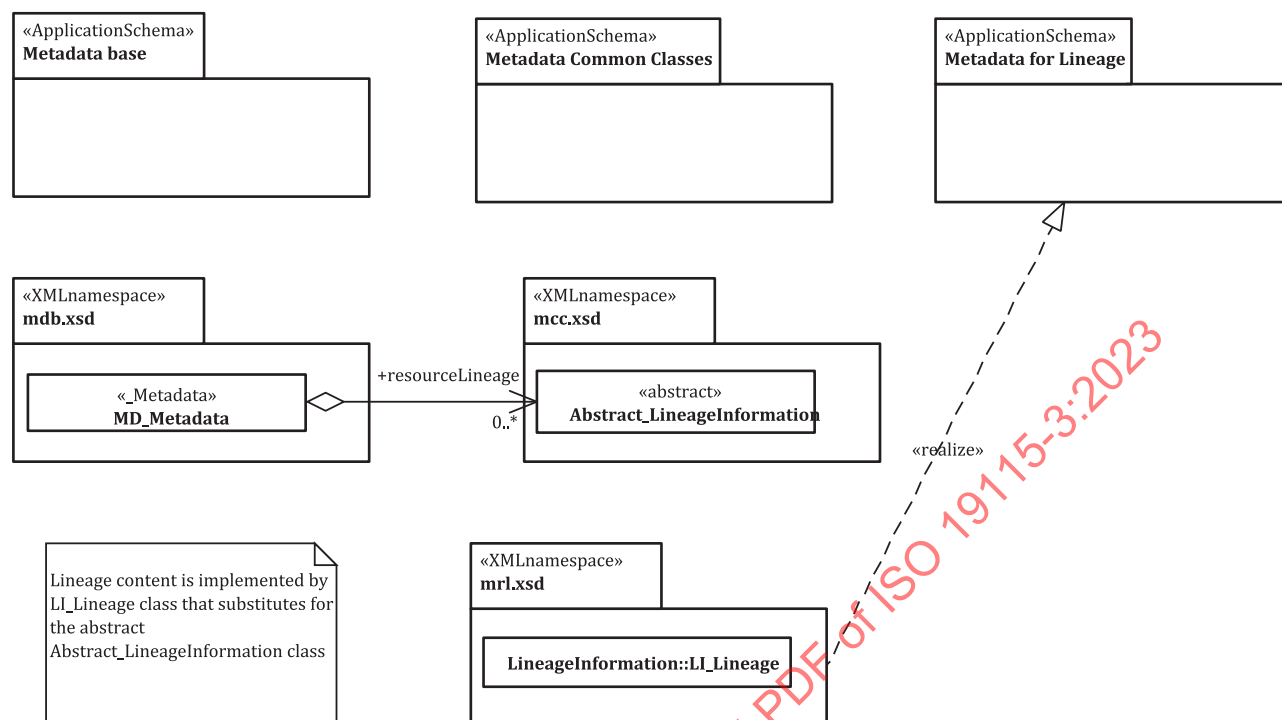
EXAMPLE 2 The following UML and XML snippets describe abstract elements in the abstract classes package (mcc). This package is the nexus for using modularized packages. The abstract elements have no content.

The XML class global element corresponding to the class (LI_Lineage) that is the property type for the optional attribute (resourceLineage) in the base class (see [Figure 5](#)).

The following XML snippet illustrates instantiation of an abstract class as presented in [Figure 5](#).

```
<element abstract="true" name="Abstract_LineageInformation"
  substitutionGroup="gco:AbstractObject" type="mcc:Abstract_LineageInformation_Type"/>
<!-- The XML Class Type for the abstract class: -->
<complexType abstract="true" name="Abstract_LineageInformation_Type">
  <complexContent>
    <extension base="gco:AbstractObject_Type">
      <sequence/> <!-- no content-->
    </extension>
  </complexContent>
</complexType>
<!-- Standard XML Class Property Type encoding for abstract class property type: -->
<complexType name="Abstract_LineageInformation_PropertyType">
  <sequence minOccurs="0">
    <element ref="mcc:Abstract_LineageInformation"/>
  </sequence>
  <attributeGroup ref="gco:ObjectReference"/>
  <attribute ref="gco:nilReason"/>
</complexType>
```

</complexType>



NOTE An abstract class is implemented in the metadata common classes namespace and used as the target of the optional property. Instantiation of the property in an XML instance requires importing of the namespace that contains a concrete class in the substitution group for the abstract class (mrl.xsd in this diagram).

Figure 5 — Implementation pattern for optional properties with a data type class in a different package

EXAMPLE 3 Definition of the concrete class in the substitution group for the abstract class, in a separate namespace (mrl).

```
<element name="LI_Lineage" substitutionGroup="mcc:Abstract_LineageInformation"
  type="mrl:LI_Lineage_Type"/>
<!-- the complex type extends the type for the abstract class -->
<complexType name="LI_Lineage_Type">
  <complexContent>
    <extension base="mcc:Abstract_LineageInformation_Type">
      <sequence>
        <!-- definition of elements in concrete instance... -->
      </sequence>
    </extension>
  </complexContent>
</complexType>
```

A metadata implementation that will use the LI_Lineage element imports the “mrl” namespace.

10.8.2 Implementation approach to decouple optional classes

The UML model uses the following pattern for classes that are the data type for property values.

When the property value type is a class that is implemented in the same UML package as the owning class, no change is made.

When a property value type is a class that is implemented in a different UML package also in this document (abstract pattern shown in [Figure 6](#)), the namespaces are decoupled by introducing an abstract class in the abstract classes package in the UML model.

The concrete class that realizes the abstract class is defined in the package for the implementation namespace, as a specialization of the abstract class, creating a dependency between the implementation package containing the class and the abstract classes package. This UML pattern is then implemented using ISO/TS 19139-1:2019, 7.3.2 encoding rules for abstract classes. Introduction of the abstract class does not change the semantics of the model being implemented, but allows for definition of new versions of the concrete implementing class without impacting the schema that uses the abstract class. [Table 175](#) shows a list of the ISO 19115-1 classes in this document's UML for XML implementation that use this pattern.

The following list details the steps for encoding an abstract class to allow decoupling of XML namespace schema.

- a) An abstract class and property type are defined in the abstract common classes XML namespace package, which is identified here by the namespace prefix “acn”. This namespace defines all abstract classes that are used to link modules that are intended for standalone use. Note that the abstract class package is introduced in the implementation UML model, and is purely an implementation artefact. XML instance documents will never contain elements from this package.

EXAMPLE 1 Step [10.8.2](#) a) defines an abstract class (named acn:AbstractClass2 in this example) following ISO/TS 19139-1:2019, 7.3.2.

```
<schema xmlns:acn=https://schemas.isotc211.org/19100/-/acn/1.0.../>
  <element abstract="true" name="AbstractClass2"
    substitutionGroup="gco:AbstractObject" type="acn:AbstractClass2_Type"/>
  <complexType abstract="true" name="AbstractClass2_Type">
    <complexContent>
      <extension base="gco:AbstractObject_Type">
        <sequence/> <!-- no content-->
      </extension>
    </complexContent>
  </complexType>
```

EXAMPLE 2 Step [10.8.2](#) a) is an implementation of a property type with a value specified by the abstract class from Example 1 following ISO/TS 19139-1:2019, 7.3.2.

```
<complexType name="AbstractClass2_PropertyType">
  <sequence minOccurs="0">
    <element ref="acn:AbstractClass2"/>
  </sequence>
  <attributeGroup ref="gco:ObjectReference"/>
  <attribute ref="gco:nilReason"/>
</complexType>
```

- b) Another namespace (identified with the prefix ns1 in Example 3) contains a class that has an optional property (cardinality 0..1 or 0..*) that is specified by the abstract class defined above. The XML namespace implementing this class imports the namespace that contains the shared abstract element definitions (above).

EXAMPLE 3 Step [10.8.2](#) b) implementation of XML schema for a namespace (“ns1”) that defines a class (Class1) with a property that has a data type specified by the abstract class from Example 1 and Example 2.

```
<schema xmlns:ns1=https://schemas.isosc211.org/19115/-1/ns1/1.0.../>
  Import the abstract-classes xml namespace:
  <import namespace="https://schemas.isotc211.org/19115/-1/acn/1.3"
    schemaLocation="../../../acn/1.3.0/acn.xsd"/>
  <!-- root entity-->
  <element name="Class1" substitutionGroup="gco:AbstractObject"
    type="ns1:Class1_Type">
  </element>
```

The class type definition for Class1, with a property (named “property”) whose value is specified by AbstractClass2 property type:

```
<complexType name="Class1_Type">
  <complexContent>
    <extension base="gco:AbstractObject_Type">
      <sequence>
        (...)
```

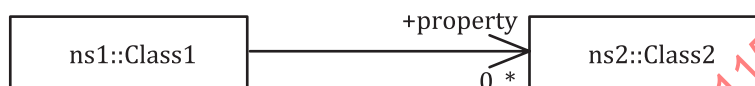
```

    <element maxOccurs="unbounded" minOccurs="0" name="property"
      type= "acn:AbstractClass2_PropertyType" />
    (...)
  </sequence>
</extension>
</complexContent>
</complexType>

```

- c) A third namespace (identified by the prefix `ns2`) defines a concrete XML element (Class2, [Figure 6](#)) that is a member of the substitution group for the abstract class (AbstractClass2). XML instances of Class1 import both the “acn” and a namespace that includes a concrete class that is substituted for AbstractClass2 (for example, Class2 in Example 3) in order to provide instances of the “property” property (see [Figure 6](#)).

EXAMPLE 4 Step [10.8.2 c](#)) implementation of XML schema for a namespace (“ns2”) that defines a concrete class (Class2) in the substitution group for AbstractClass2.



NOTE Properties inside of Class2 are not shown.

Figure 6 — Example of optional property that has a class property type

```

<element name="Class2" substitutionGroup="acn:AbstractClass2"
  type="ns2:Class2_Type"/>
<!-- the complex type extends the type for the abstract class-->
<complexType name="Class2_Type">
  <complexContent>
    <extension base="acn:AbstractClass2_Type">
      <sequence>
        <!--definition of elements in concrete instance... -->
      </sequence>
    </extension>
  </complexContent>
</complexType>

```

10.9 XML encoding rules

The namespace <https://schemas.isotc211.org/19115/-1/mcc/1.3> includes elements that implement abstract classes necessary for encoding optional class property types defined in ISO 19115-1 and ISO 19115-2 according to the implementation rule in ISO/TS 19139-1:2019, 9.3.1. [Table 175](#) summarizes the required classes. Encoding rules are briefly discussed in [Annex C](#).

Table 175 — Summary of properties implemented with an abstract element as their data type within the Metadata common classes package

Abstract class	Namespace defining concrete implementation
Abstract_Metadata	Metadata information
Abstract_ResourceDescription	Identification information
Abstract_SpatialResolution	Identification information
Abstract_Constraints	Constraint information
Abstract_LineageInformation	Lineage information
Abstract_MaintenanceInformation	Maintenance information
Abstract_SpatialRepresentation	Spatial representation information
Abstract_ReferenceSystem	Reference system information
Abstract_ContentInformation	Content information
Abstract_PortrayalCatalogueInformation	Portrayal catalogue information

Table 175 (continued)

Abstract class	Namespace defining concrete implementation
Abstract_Distribution	Distribution information
Abstract_Format	Distribution information
Abstract_MetadataExtension	Metadata extension information
Abstract_ApplicationSchemaInformation	Metadata for application schema
Abstract_Citation	Citation and responsibility information
Abstract_OnlineResource	Citation and responsibility information
Abstract_Responsibility	Citation and responsibility information
Abstract_StandardOrderProcess	Citation and responsibility information
Abstract_TypedDate	Citation and responsibility information
Abstract_AcquisitionInformation	Acquisition information (ISO 19115-2)
Abstract_Platform	Metadata for acquisition (ISO 19115-2)
Abstract_Parameter	Extended lineage information (ISO 19115-2)

ISO/TS 19139-1:2019, Clauses 7 to 9 describe the details of encoding the UML conceptual schema into a set of XML schemas. The XML schema implementation for this document follows the rules and patterns described in those clauses, applying them to the UML model for XML implementation. One additional rule was required in order to support the implementation model described in ISO/TS 19139-1:2019, 9.2 and to improve modularization of the XML schema implementation. [Table 176](#) lists the encoding rules used for each UML class.

Table 176 — Encoding rules used to generate XML schema for this document

UML classifier	External class	Encoding rule
GM_Object GM_Point	gml:AbstractGeometry gml:Point	https://standards.iso.org/iso19139/-1/1/req/external/XCGE
TM_Object TM_Primitive TM_PeriodDuration	gml:AbstractTimePrimitive xs:duration	https://standards.iso.org/iso19139/-1/1/req/external/XCGE
SC_CRS	gml:AbstractCRS	https://standards.iso.org/iso19139/-1/1/req/external/XCGE
UML classes, attributes and properties not explicitly assigned an encoding rule by other core encoding requirements		https://standards.iso.org/iso19139/-1/1/req/external/XCGE https://standards.iso.org/iso19139/-1/1/req/external/XCGE https://standards.iso.org/iso19139/-1/1/req/external/XCGE https://standards.iso.org/iso19139/-1/1/req/external/XCGE

10.10 Default values

For metadata encoding using this document, the following default values are defined:

- defaultLocale language = en, for both metadata and data identification;
- defaultLocale character set code = UTF-8, for both metadata and data identification;
- MD_Metadata.metadataScope.MD_MetadataScope.resourceScope code = dataset.

Annex A (normative)

Conformance test suite

A.1 General

A.1.1 Abstract test suite

This document provides abstract tests for its defined requirements. Wherever possible, this document provides tools for an executable test suite for XML instances that claim conformance to a given International Standard.

NOTE ISO 19115-1 and ISO 19115-2 define their respective abstract test suites.

A.1.2 Conformance test tools

This document provides XML schema definitions files to test most of the requirements of ISO 19115-1 and ISO 19115-2 and their conceptual models. Some aspects cannot be tested in XML schema so Schematron rules and code are provided for additional conformance testing.

For example, in ISO/TS 19139-1:2019, 7.2.3.2, a property element following the default XML class property type (XCPT) pattern may have an inline content (by-value) that is an XML Class, an xlink:href attribute (by-reference value), or a gco:nilReason attribute (nil value). As XML schema cannot constrain the co-occurrence of content or attributes, some mechanism in addition to XML schema validation needs to be used to restrict a property to be exclusively by-value or by-reference or a nil value. As another example, XML schema validation does not support the enforcement of co-constraints such as the requirement that an extent in the form of an EX_GeographicBoundingBox or EX_GeographicDescription be used in the MD_Identification object when the hierarchyLevel of MD_Metadata is equal to “dataset”.

Rules implementing these constraints are included in the Schematron rule set. If a tool for Schematron validation is not available, conformance to these requirements can need to be tested by inspection.

A.2 Conformance to ISO 19115-1 and ISO 19115-2 requirements for metadata modules

The conformance classes and conformance tests defined in this document for ISO 19115-1 and ISO 19115-2 are provided in [Table A.1](#) to [Table A.25](#).

The corresponding requirements are defined at [Clause 6](#).

Table A.1 — Conformance class A.1: Metadata core (ISO 19115-1)

Identifier	https://standards.iso211.org/19115/-1/1/conf/metadata-core
Requirements class	Requirements class 1: Metadata core (ISO 19115-1)

Table A.1 (continued)

Conformance tests	Conformance test A.1: Metadata basic data requirements
	Conformance test A.2: Metadata application information data requirements
	Conformance test A.3: Identification information data requirements
	Conformance test A.4: Constraint information data requirements
	Conformance test A.5: Lineage information data requirements
	Conformance test A.6: Maintenance information data requirements
	Conformance test A.7: Spatial representation information data requirements
	Conformance test A.8: Reference system information data requirements
	Conformance test A.9: Content information data requirements
	Conformance test A.10: Portrayal catalogue information data requirements
	Conformance test A.11: Distribution information data requirements
	Conformance test A.12: Metadata extension information data requirements
	Conformance test A.13: Application schema information data requirements
	Conformance test A.14: Service metadata information data requirements
	Conformance test A.15: Extent information data requirements
	Conformance test A.16: Citation, responsibility and party information data requirements
	Conformance test A.17: Commonly used classes data requirements
	Conformance test A.18: Multilingual support data requirements

Table A.2 — Conformance test A.1: Metadata basic data requirements

Identifier	https://standards.iso211.org/19115/-1/1/conf/metadata-core/basic
Requirement	Requirement 1: Metadata basic data requirements
Included in	Conformance class A.1: Metadata core (ISO 19115-1)
Description	A metadata instance conforms to rules defined in ISO 19115-1:2014, 6.5.2.

Table A.3 — Conformance test A.2: Metadata application information data requirements

Identifier	https://standards.iso211.org/19115/-1/1/conf/metadata-core/application
Requirement	Requirement 2: Metadata application information data requirements
Included in	Conformance class A.1: Metadata core (ISO 19115-1)
Description	A metadata instance adheres to rules defined in ISO 19115-1:2014, 6.2.

Table A.4 — Conformance test A.3: Identification information data requirements

Identifier	https://standards.iso211.org/19115/-1/1/conf/metadata-core/identification
Requirement	Requirement 3: Identification information data requirements
Included in	Conformance class A.1: Metadata core (ISO 19115-1)
Description	A metadata instance conforms to rules defined in ISO 19115-1:2014, 6.5.3.

Table A.5 — Conformance test A.4: Constraint information data requirements

Identifier	https://standards.iso211.org/19115/-1/1/conf/metadata-core/constraints
Requirement	Requirement 4: Constraint information data requirements
Included in	Conformance class A.1: Metadata core (ISO 19115-1)
Description	A metadata instance conforms to rules defined in ISO 19115-1:2014, 6.5.4.

Table A.6 — Conformance test A.5: Lineage information data requirements

Identifier	https://standards.iso/19115-3:2023/1/1/conf/metadata-core/lineage
Requirement	Requirement 5: Lineage information data requirements
Included in	Conformance class A.1: Metadata core (ISO 19115-1)
Description	A metadata instance conforms to rules defined in ISO 19115-1:2014, 6.5.5.

Table A.7 — Conformance test A.6: Maintenance information data requirements

Identifier	https://standards.iso/19115-3:2023/1/1/conf/metadata-core/maintenance
Requirement	Requirement 6: Maintenance information data requirements
Included in	Conformance class A.1: Metadata core (ISO 19115-1)
Description	A metadata instance conforms to rules defined in ISO 19115-1:2014, 6.5.6.

Table A.8 — Conformance test A.7: Spatial representation information data requirements

Identifier	https://standards.iso/19115-3:2023/1/1/conf/metadata-core/spatial-representation
Requirement	Requirement 7: Spatial representation information data requirements
Included in	Conformance class A.1: Metadata core (ISO 19115-1)
Description	A metadata instance conforms to rules defined in ISO 19115-1:2014, 6.5.7.

Table A.9 — Conformance test A.8: Reference system information data requirements

Identifier	https://standards.iso/19115-3:2023/1/1/conf/metadata-core/reference-system
Requirement	Requirement 8: Reference system information data requirements
Included in	Conformance class A.1: Metadata core (ISO 19115-1)
Description	A metadata instance conforms to rules defined in ISO 19115-1:2014, 6.5.8.

Table A.10 — Conformance test A.9: Content information data requirements

Identifier	https://standards.iso/19115-3:2023/1/1/conf/metadata-core/content
Requirement	Requirement 9: Content information data requirements
Included in	Conformance class A.1: Metadata core (ISO 19115-1)
Description	A metadata instance conforms to rules defined in ISO 19115-1:2014, 6.5.9.

Table A.11 — Conformance test A.10: Portrayal catalogue information data requirements

Identifier	https://standards.iso/19115-3:2023/1/1/conf/metadata-core/portrayal-catalogue
Requirement	Requirement 10: Portrayal catalogue information data requirements
Included in	Conformance class A.1: Metadata core (ISO 19115-1)
Description	A metadata instance conforms to rules defined in ISO 19115-1:2014, 6.5.10.

Table A.12 — Conformance test A.11: Distribution information data requirements

Identifier	https://standards.iso/19115-3:2023/1/1/conf/metadata-core/distribution
Requirement	Requirement 11: Distribution information data requirements
Included in	Conformance class A.1: Metadata core (ISO 19115-1)
Description	A metadata instance conforms to rules defined in ISO 19115-1:2014, 6.5.11.

Table A.13 — Conformance test A.12: Metadata extension information data requirements

Identifier	https://standards.iso211.org/19115/-1/1/conf/metadata-core/metadata-extension
Requirement	Requirement 12: Metadata extension information data requirements
Included in	Conformance class A.1: Metadata core (ISO 19115-1)
Description	A metadata instance conforms to rules defined in ISO 19115-1:2014, 6.5.12.

Table A.14 — Conformance test A.13: Application schema information data requirements

Identifier	https://standards.iso211.org/19115/-1/1/conf/metadata-core/application-schema
Requirement	Requirement 13: Application schema information data requirements
Included in	Conformance class A.1: Metadata core (ISO 19115-1)
Description	A metadata instance conforms to rules defined in ISO 19115-1:2014, 6.5.13.

Table A.15 — Conformance test A.14: Service metadata information data requirements

Identifier	https://standards.iso211.org/19115/-1/1/conf/metadata-core/service-metadata
Requirement	Requirement 14: Service metadata information data requirements
Included in	Conformance class A.1: Metadata core (ISO 19115-1)
Description	A metadata instance conforms to rules defined in ISO 19115-1:2014, 6.5.14.

Table A.16 — Conformance test A.15: Extent information data requirements

Identifier	https://standards.iso211.org/19115/-1/1/conf/metadata-core/extent
Requirement	Requirement 15: Extent information data requirements
Included in	Conformance class A.1: Metadata core (ISO 19115-1)
Description	A metadata instance conforms to rules defined in ISO 19115-1:2014, 6.6.1.

Table A.17 — Conformance test A.16: Citation, responsibility and party information data requirements

Identifier	https://standards.iso211.org/19115/-1/1/conf/metadata-core/citation
Requirement	Requirement 16: Citation, responsibility and party information data requirements
Included in	Conformance class A.1: Metadata core (ISO 19115-1)
Description	A metadata instance conforms to rules defined in ISO 19115-1:2014, 6.6.2, 6.6.3.

Table A.18 — Conformance test A.17: Commonly used classes data requirements

Identifier	https://standards.iso211.org/19115/-1/1/conf/metadata-core/common
Requirement	Requirement 17: Commonly used classes data requirements
Included in	Conformance class A.1: Metadata core (ISO 19115-1)
Description	A metadata instance conforms to rules defined in ISO 19115-1:2014, 6.6.4.

Table A.19 — Conformance test A.18: Multilingual support data requirements

Identifier	https://standards.iso211.org/19115/-1/1/conf/metadata-core/multilingual
Requirement	Requirement 18: Multilingual support data requirements
Included in	Conformance class A.1: Metadata core (ISO 19115-1)
Description	A metadata instance conforms to rules defined in ISO 19115-1:2014, 6.7.

Table A.20 — Conformance class A.2: Metadata extensions and profiles (ISO 19115-1)

Identifier	https://standards.iso211.org/19115/-1/1/conf/metadata-extend
Requirements class	Requirements class 2: Metadata extensions and profiles (ISO 19115-1)
Prerequisite	Requirements class 1: Metadata core (ISO 19115-1)
Conformance tests	Conformance test A.19: Metadata extension Conformance test A.20: Metadata profile

Table A.21 — Conformance test A.19: Metadata extension

Identifier	https://standards.iso211.org/19115/-1/1/conf/metadata-extend/extension
Requirement	Requirement 19: Metadata extension
Included in	Conformance class A.2: Metadata extensions and profiles (ISO 19115-1)
Description	A metadata extension scheme conforms to rules defined in ISO 19115-1:2014, Clause C.3, Clause C.4.

Table A.22 — Conformance test A.20: Metadata profile

Identifier	https://standards.iso211.org/19115/-1/1/conf/metadata-extend/profile
Requirement	Requirement 20: Metadata profile
Included in	Conformance class A.2: Metadata extensions and profiles (ISO 19115-1)
Description	A metadata profile conforms to rules defined in ISO 19115-1:2014, Clause C.5, Clause C.6.
Guidance	Re-used by reference in ISO 19115-2:2019.

Table A.23 — Conformance class A.3: Extensions for acquisition and processing (ISO 19115-2)

Identifier	https://standards.iso211.org/19115/-2/2/conf/metadata-extensions
Requirements class	Requirements class 3: Extensions for acquisition and processing (ISO 19115-2)
Prerequisite	Requirements class 1: Metadata core (ISO 19115-1)
Conformance tests	Conformance test A.21: Acquisition information data requirements Conformance test A.22: Extended lineage information data requirements

Table A.24 — Conformance test A.21: Acquisition information data requirements

Identifier	https://standards.iso211.org/19115/-2/2/conf/metadata-extensions/acquisition
Requirement	Requirement 21: Acquisition information data requirements
Included in	Conformance class A.3: Extensions for acquisition and processing (ISO 19115-2)
Description	A metadata instance conforms to rules defined in ISO 19115-2:2019, 6.3.2.

Table A.25 — Conformance test A.22: Extended lineage information data requirements

Identifier	https://standards.iso211.org/19115/-2/2/conf/metadata-extensions/extended-lineage
Requirement	Requirement 22: Extended lineage information data requirements
Included in	Conformance class A.3: Extensions for acquisition and processing (ISO 19115-2)
Prerequisite	Requirement 5: Lineage information data requirements
Description	A metadata instance conforms to rules defined in ISO 19115-2:2019, 6.3.3.

A.3 Conformance to defined XML encodings

A.3.1 General

This clause provides conformance information on the defined XML encodings.

Conformance classes for requirements related to XML instance documents (the conformance target) are tested by XML schema validation, the use of Schematron rule sets, and by inspection of instance documents.

The corresponding requirements are defined in [Clause 8](#).

A.3.2 Minimal metadata interchange document

The conformance class specified in [Clause 7](#) defines a minimal metadata document conforming to ISO 19115-1.

This conformance class is intended as a lightweight starting point for profiles that will selectively use other metadata modules from this document, and can potentially use other implementations for some of the modules.

The conformance classes specified in this clause define XML schema that import one or more metadata modules to allow implementation of metadata records for various use scenarios.

The conformance target is a complete metadata XML instance document.

The conformance classes with conformance tests are described in [Table A.26](#) to [Table A.35](#).

Table A.26 — Conformance class A.4: Validation of minimum valid XML metadata instance (ISO 19115-1)

Identifier	https://standards.iso211.org/19115/-1/1/conf/metadata-minimal-xml
Requirements class	Requirements class 4: Metadata information minimum interchange (ISO 19115-1)
Conformance tests	Conformance test A.23: Valid minimum metadata XML instance Conformance test A.24: Namespaces required by minimum metadata XML instance Conformance test A.25: Valid root class of the metadata minimal instance Conformance test A.26: Valid contact information related to the metadata Conformance test A.27: Valid metadata creation date Conformance test A.28: Valid metadata scope Conformance test A.29: Contains identification information Conformance test A.30: Only uses valid namespaces Conformance test A.31: Verifiable by Schematron

Table A.27 — Conformance test A.23: Valid minimum metadata XML instance

Identifier	https://standards.iso211.org/19115/-1/1/conf/metadata-minimal-xml/valid
Requirement	Requirement 23: Valid minimum metadata XML instance
Included in	Conformance class A.4: Validation of minimum valid XML metadata instance (ISO 19115-1)
Test type	Validation
Test purpose	Verify that the minimal XML metadata instance document is well-formed and valid.
Test method	Use an XML validation tool to determine if XML instance is valid using the XML schema <code>mdb.xsd</code> . See discussion of validation tools in A.3.6 .

Table A.28 — Conformance test A.24: Namespaces required by minimum metadata XML instance

Identifier	https://standards.iso211.org/19115/-1/1/conf/metadata-minimal-xml/namespaces
Requirement	Requirement 24: Namespaces required by minimum metadata XML instance
Included in	Conformance class A.4: Validation of minimum valid XML metadata instance (ISO 19115-1)
Prerequisites	Conformance class A.7: Validation of XML instance for metadata basic information (ISO 19115-1) Conformance class A.21: Validation of XML instance for citation, responsibility and party information (ISO 19115-1) Conformance class A.22: Validation of XML instance for common classes (ISO 19115-1) Conformance class A.8: Validation of XML instance for identification information (ISO 19115-1) Conformance class A.23: Validation of XML instance for multilingual support (language localization) (ISO 19115-1) Conformance class A.20: Validation of XML instance for extent information (ISO 19115-1) Conformance class A.19: Validation of XML instance for service metadata information (ISO 19115-1)
Test type	Validation
Test purpose	Verify that the dependent namespaces are imported.
Test method	Verify that the document validates with Schematron rule set metadata-minimal.sch.

Table A.29 — Conformance test A.25: Valid root class of the metadata minimal instance

Identifier	https://standards.iso211.org/19115/-1/1/conf/metadata-minimal-xml/root-element
Requirement	Requirement 25: Root element of the metadata minimal instance is an MD_Metadata element
Included in	Conformance class A.4: Validation of minimum valid XML metadata instance (ISO 19115-1)
Test type	Validation
Test purpose	Verify that the root class for metadata record contains an MD_Metadata element.
Test method	Verify that the document validates with Schematron rule set metadata-minimal.sch.

Table A.30 — Conformance test A.26: Valid contact information related to the metadata

Identifier	https://standards.iso211.org/19115/-1/1/conf/metadata-minimal-xml/contact-information
Requirement	Requirement 26: Provides contact information related to the metadata
Included in	Conformance class A.4: Validation of minimum valid XML metadata instance (ISO 19115-1)
Prerequisite	Conformance class A.21: Validation of XML instance for citation, responsibility and party information (ISO 19115-1)
Test type	Validation
Test purpose	Verify that the contact information is provided in the MD_Metadata element attribute contact in the form of a CI_Responsibility element.
Test method	Verify that the document validates with Schematron rule set metadata-minimal.sch.

Table A.31 — Conformance test A.27: Valid metadata creation date

Identifier	https://standards.iso211.org/19115/-1/1/conf/metadata-minimal-xml/creation-date
Requirement	Requirement 27: Provides creation date of the metadata
Included in	Conformance class A.4: Validation of minimum valid XML metadata instance (ISO 19115-1)
Test type	Validation

Table A.31 (continued)

Test purpose	Verify that the MD_Metadata element instance specifies a creation date for the metadata record.
Test method	Verify that the document validates with Schematron rule set metadata-minimal.sch.

Table A.32 — Conformance test A.28: Valid metadata scope

Identifier	https://standards.iso211.org/19115/-1/1/conf/metadata-minimal-xml/metadata-scope
Requirement	Requirement 28: Provides metadata scope of the metadata
Included in	Conformance class A.4: Validation of minimum valid XML metadata instance (ISO 19115-1)
Test type	Validation
Test purpose	Verify that the MD_Metadata.metadataScope element is provided if the metadata instance scope is not a dataset.
Test method	Verify that the document validates with Schematron rule set metadata-minimal.sch.

Table A.33 — Conformance test A.29: Contains identification information

Identifier	https://standards.iso211.org/19115/-1/1/conf/metadata-minimal-xml/identification
Requirement	Requirement 29: Provides identification of the metadata
Included in	Conformance class A.4: Validation of minimum valid XML metadata instance (ISO 19115-1)
Test type	Validation
Test purpose	Verify that the instance contains a concrete element that provides the MD_Metadata.dataIdentification property value that is either mri:MD_DataIdentification or srv:SV_ServiceIdentification.
Test method	Verify that the document validates with Schematron rule set metadata-minimal.sch.

Table A.34 — Conformance test A.30: Only uses valid namespaces

Identifier	https://standards.iso211.org/19115/-1/1/conf/metadata-minimal-xml/allowed-namespaces
Requirement	Requirement 31: Allowed namespaces of the metadata minimal instance
Included in	Conformance class A.4: Validation of minimum valid XML metadata instance (ISO 19115-1)
Test type	Validation
Test purpose	Verify that the MD_Metadata element instance contains only child elements in the mcc, cit, lan, mri, mdq, gex, gco, or gmw namespace.
Test method	Use an XML validation tool to determine if the XML instance is valid using the XML schema mdb.xsd . See discussion of validation tools in A.3.6 .

Table A.35 — Conformance test A.31: Verifiable by Schematron

Identifier	https://standards.iso211.org/19115/-1/1/conf/metadata-minimal-xml/schematron-rules
Requirements	Requirement 30: Defines necessary abstract classes Requirement 44: Provides geographic extent of dataset Requirement 45: Topic category of resource identification instance
Included in	Conformance class A.4: Validation of minimum valid XML metadata instance (ISO 19115-1)
Test type	Validation
Test purpose	Verify that the XML instance is conformant with additional constraints that cannot be tested by XML schema.
Test method	Verify that the document validates with Schematron rule set metadata-minimal.sch.

A.3.3 XML validity

The conformance class and conformance tests defined for checking XML validity are provided in [Table A.36](#) to [Table A.38](#).

The corresponding requirements class is located in [8.4](#).

Table A.36 — Conformance class A.5: Validation of the XML instance. (ISO 19115-3)

Identifier	https://standards.iso211.org/19115/-3/2/conf/valid-instance
Requirements class	Requirements class 5: Validity of XML instance documents (ISO 19115-3)
Conformance tests	Conformance test A.32: Verify through XSD Conformance test A.33: Verify through Schematron

Table A.37 — Conformance test A.32: Verify through XSD

Identifier	https://standards.iso211.org/19115/-3/2/conf/valid-instance/xsd
Requirement	Requirement 32: Validity of XML instance via XSD
Included in	Conformance class A.5: Validation of the XML instance. (ISO 19115-3)
Test type	Conformance
Test purpose	Verify that the instance document is well-formed and valid, insofar as XSD can determine.
Test method	Validate the instance against the XSDs using a validating parser.

Table A.38 — Conformance test A.33: Verify through Schematron

Identifier	https://standards.iso211.org/19115/-3/2/conf/valid-instance/schematron
Requirement	Requirement 33: Validity of XML instance via Schematron
Included in	Conformance class A.5: Validation of the XML instance. (ISO 19115-3)
Test type	Conformance
Test purpose	Verify that the instance document is valid.
Test method	Validate the instance against the Schematron rules.

A.3.4 Metadata modules

A.3.4.1 General

All tests are based on validating conforming documents with the specified XML schema document and Schematron document (if one is specified). The location of normative XML schema and Schematron rule set documents is specified in [Annex B](#). The conformance target is an XML instance document encoding a single metadata module. For validation using XSDs, refer to the discussion of validation tools in [A.3.6](#).

A.3.4.2 Derived from ISO 19115-1

The following conformance classes correspond to the requirements classes detailed in [8.5.2](#).

The conformance classes with conformance tests are described in [Table A.39](#) to [Table A.110](#).

Table A.39 — Conformance class A.6: Validation of XML instance for metadata application information (ISO 19115-1)

Identifier	https://standards.iso211.org/19115/-1/1/conf/metadata-xml/application
Requirements class	Requirements class 6: XML implementation of metadata application information (ISO 19115-1)
Prerequisites	Conformance class A.25: XML package for Base Types Extended (ISO 19103) Conformance class A.27: Validation of XML metadata instance with extended content model (ISO 19115-1)
Conformance test	Conformance test A.34: Validate with XSD

Table A.40 — Conformance test A.34: Validate with XSD

Identifier	https://standards.iso211.org/19115/-1/1/conf/metadata-xml/application/valid
Requirement	Requirement 34: Valid metadata application instance
Included in	Conformance class A.6: Validation of XML instance for metadata application information (ISO 19115-1)
Test type	Validation
Test purpose	Verify that instances of XML elements from the namespace https://schemas.iso211.org/19115/-1/mda/1.3 validate.
Test method	Use an XML validation tool to determine if XML instance is valid using the XML schema mda.xsd. See discussion of validation tools in A.3.6 .

Table A.41 — Conformance class A.7: Validation of XML instance for metadata basic information (ISO 19115-1)

Identifier	https://standards.iso211.org/19115/-1/1/conf/metadata-xml/basic
Requirements class	Requirements class 7: XML implementation of metadata basic information (ISO 19115-1)
Prerequisites	Conformance class A.4: Validation of minimum valid XML metadata instance (ISO 19115-1) Conformance class A.22: Validation of XML instance for common classes (ISO 19115-1) Conformance class A.23: Validation of XML instance for multilingual support (language localization) (ISO 19115-1)
Conformance tests	Conformance test A.35: Validate with XSD Conformance test A.36: Verify presence of identification information Conformance test A.37: Verify identification information exists for upper-level object if this exists Conformance test A.38: Verify presence of language information Conformance test A.39: Verify presence of character encoding information Conformance test A.40: Verify presence of metadata scope name

Table A.42 — Conformance test A.35: Validate with XSD

Identifier	https://standards.iso211.org/19115/-1/1/conf/metadata-xml/basic/schema-valid
Requirement	Requirement 35: Valid metadata basic instance
Included in	Conformance class A.7: Validation of XML instance for metadata basic information (ISO 19115-1)
Test method	Validate with metadataBase.xsd

Table A.43 — Conformance test A.36: Verify presence of identification information

Identifier	https://standards.iso211.org/19115/-1/1/conf/metadata-xml/basic/identification
Requirement	Requirement 36: Identification of metadata base instance
Included in	Conformance class A.7: Validation of XML instance for metadata basic information (ISO 19115-1)
Test method	Inspection to determine that the element populating the “identification” property is defined in the substitution group for Abstract_ResourceDescription.

Table A.44 — Conformance test A.37: Verify identification information exists for upper-level object if this exists

Identifier	https://standards.iso211.org/19115/-1/1/conf/metadata-xml/basic/parent-metadata
Requirement	Requirement 37: Identification of upper-level object if this exists
Included in	Conformance class A.7: Validation of XML instance for metadata basic information (ISO 19115-1)
Test method	If an upper-level object to an instance of MD_Metadata exists, verify that the MD_Metadata property “parentMetadata” is provided.
Guidance	Automated code can be constructed to implement this conformance test.

Table A.45 — Conformance test A.38: Verify presence of language information

Identifier	https://standards.iso211.org/19115/-1/1/conf/metadata-xml/basic/language
Requirement	Requirement 38: Language of metadata base instance
Included in	Conformance class A.7: Validation of XML instance for metadata basic information (ISO 19115-1)
Test method	Inspection of XML document to determine if language content is the default language (English) if no defaultLocale value is provided, or that the language content matches the language specified in the defaultLocale language property.
Guidance	Automated code can be constructed to implement this conformance test.

Table A.46 — Conformance test A.39: Verify presence of character encoding information

Identifier	https://standards.iso211.org/19115/-1/1/conf/metadata-xml/basic/character-encoding
Requirement	Requirement 39: Character encoding of metadata base instance
Included in	Conformance class A.7: Validation of XML instance for metadata basic information (ISO 19115-1)
Test method	Inspection of XML document to determine if character encoding is the default encoding (UTF-8) if no defaultLocale language value is provided, or that the character encoding matches the encoding specified in the defaultLocale characterEncoding property.
Guidance	Automated code can be constructed to implement this conformance test.

Table A.47 — Conformance test A.40: Verify presence of metadata scope name

Identifier	https://standards.iso211.org/19115/-1/1/conf/metadata-xml/basic/metadata-scope-name
Requirement	Requirement 40: Scope name of metadata base instance
Included in	Conformance class A.7: Validation of XML instance for metadata basic information (ISO 19115-1)
Test method	Verify that the document validates with Schematron rule set metadata-base.sch.

Table A.48 — Conformance class A.8: Validation of XML instance for identification information (ISO 19115-1)

Identifier	https://standards.iso211.org/19115/-1/1/conf/metadata-xml/identification
Requirements class	Requirements class 8: XML implementation of identification information (ISO 19115-1)
Prerequisites	Conformance class A.4: Validation of minimum valid XML metadata instance (ISO 19115-1) Conformance class A.22: Validation of XML instance for common classes (ISO 19115-1) Conformance class A.21: Validation of XML instance for citation, responsibility and party information (ISO 19115-1) Conformance class A.26: XML package for GML Wrapper (ISO 19136)
Conformance tests	Conformance test A.41: Validate with XSD Conformance test A.42: Validate with Schematron Conformance test A.43: Check MD_Identification property “citation” Conformance test A.44: Validate presence of MD_Identification property “abstract” Conformance test A.45: Validate value of MD_RepresentativeFraction property “denominator”

Table A.49 — Conformance test A.41: Validate with XSD

Identifier	https://standards.iso211.org/19115/-1/1/conf/metadata-xml/identification/schema-valid
Requirement	Requirement 41: Valid identification instance
Included in	Conformance class A.8: Validation of XML instance for identification information (ISO 19115-1)
Test method	Validate with mri.xsd

Table A.50 — Conformance test A.42: Validate with Schematron

Identifier	https://standards.iso211.org/19115/-1/1/conf/metadata-xml/identification/schematron-rules
Requirements	Requirement 45: Topic category of resource identification instance Requirement 46: Associated resource of resource identification instance
Included in	Conformance class A.8: Validation of XML instance for identification information (ISO 19115-1)
Test method	Validate with mri.sch

Table A.51 — Conformance test A.43: Check MD_Identification property “citation”

Identifier	https://standards.iso211.org/19115/-1/1/conf/metadata-xml/identification/citation
Requirement	Requirement 42: Title of resource identification instance
Included in	Conformance class A.8: Validation of XML instance for identification information (ISO 19115-1)
Test method	If an MD_Identification element exists, check if the “citation” property provides valid CI_Citation instance with the CI_Citation.title property set as a character string.
Guidance	Automated code can be constructed to implement this conformance test.

Table A.52 — Conformance test A.44: Validate presence of MD_Identification property “abstract”

Identifier	https://standards.iso211.org/19115/-1/1/conf/metadata-xml/identification/abstract
Requirement	Requirement 43: Abstract of resource identification instance
Included in	Conformance class A.8: Validation of XML instance for identification information (ISO 19115-1)
Test method	If an MD_Identification element exists, check if the “abstract” property has value.
Guidance	Automated code can be constructed to implement this conformance test.

Table A.53 — Conformance test A.45: Validate value of MD_RepresentativeFraction property “denominator”

Identifier	https://standards.iso211.org/19115/-1/1/conf/metadata-xml/identification/representative-fraction-denominator
Requirement	Requirement 47: Value of MD_RepresentativeFraction property “denominator”
Included in	Conformance class A.8: Validation of XML instance for identification information (ISO 19115-1)
Test method	If an MD_RepresentativeFraction element exists, confirm that its property “denominator” has a value greater than 0.
Guidance	Automated code can be constructed to implement this conformance test.

Table A.54 — Conformance class A.9: Validation of XML instance for constraint information (ISO 19115-1)

Identifier	https://standards.iso211.org/19115/-1/1/conf/metadata-xml/constraints
Requirements class	Requirements class 9: XML implementation of constraint information (ISO 19115-1)
Prerequisites	Conformance class A.21: Validation of XML instance for citation, responsibility and party information (ISO 19115-1) Conformance class A.22: Validation of XML instance for common classes (ISO 19115-1)
Conformance tests	Conformance test A.46: Validate with XSD Conformance test A.47: Validate with Schematron

Table A.55 — Conformance test A.46: Validate with XSD

Identifier	https://standards.iso211.org/19115/-1/1/conf/metadata-xml/constraints/schema-valid
Requirement	Requirement 48: Valid constraint instance
Included in	Conformance class A.9: Validation of XML instance for constraint information (ISO 19115-1)
Test method	Validate with mco.xsd.

Table A.56 — Conformance test A.47: Validate with Schematron

Identifier	https://standards.iso211.org/19115/-1/1/conf/metadata-xml/constraints/schematron-rules
Requirements	Requirement 49: Legal constraints of constraints instance Requirement 50: Other restrictions of constraints instance Requirement 51: Releasability of constraints instance
Included in	Conformance class A.9: Validation of XML instance for constraint information (ISO 19115-1)
Test method	Validate with mco.sch.

Table A.57 — Conformance class A.10: Validation of XML instance for resource lineage information (ISO 19115-1)

Identifier	https://standards.iso211.org/19115/-1/1/conf/metadata-xml/lineage
Requirements class	Requirements class 10: XML implementation of resource lineage information (ISO 19115-1)
Prerequisites	Conformance class A.21: Validation of XML instance for citation, responsibility and party information (ISO 19115-1) Conformance class A.22: Validation of XML instance for common classes (ISO 19115-1) Conformance class A.26: XML package for GML Wrapper (ISO 19136) Conformance test A.22: Extended lineage information data requirements
Conformance tests	Conformance test A.48: Validate with XSD Conformance test A.49: Validate with Schematron

Table A.58 — Conformance test A.48: Validate with XSD

Identifier	https://standards.iso211.org/19115/-1/1/conf/metadata-xml/lineage/schema-valid
Requirement	Requirement 52: Valid application schema instance
Included in	Conformance class A.10: Validation of XML instance for resource lineage information (ISO 19115-1)
Test method	Validate with mrl.xsd.

Table A.59 — Conformance test A.49: Validate with Schematron

Identifier	https://standards.iso211.org/19115/-1/1/conf/metadata-xml/lineage/schematron-rules
Requirements	Requirement 53: Lineage content of lineage instance Requirement 54: Source of lineage instance
Included in	Conformance class A.10: Validation of XML instance for resource lineage information (ISO 19115-1)
Test method	Validate with mrl.sch.

Table A.60 — Conformance class A.11: Validation of XML instance for maintenance information (ISO 19115-1)

Identifier	https://standards.iso211.org/19115/-1/1/conf/metadata-xml/maintenance
Requirements class	Requirements class 11: XML implementation of maintenance information (ISO 19115-1)
Prerequisites	Conformance class A.21: Validation of XML instance for citation, responsibility and party information (ISO 19115-1) Conformance class A.22: Validation of XML instance for common classes (ISO 19115-1)
Conformance tests	Conformance test A.50: Validate with XSD Conformance test A.51: Validate with Schematron

Table A.61 — Conformance test A.50: Validate with XSD

Identifier	https://standards.iso211.org/19115/-1/1/conf/metadata-xml/maintenance/schema-valid
Requirement	Requirement 55: Valid maintenance information instance
Included in	Conformance class A.11: Validation of XML instance for maintenance information (ISO 19115-1)
Test method	Validate with mmi.xsd.

Table A.62 — Conformance test A.51: Validate with Schematron

Identifier	https://standards.iso211.org/19115/-1/1/conf/metadata-xml/maintenance/schematron-rules
Requirement	Requirement 56: Frequency of maintenance information instance
Included in	Conformance class A.11: Validation of XML instance for maintenance information (ISO 19115-1)
Test method	Validate with mmi.sch.

Table A.63 — Conformance class A.12: Validation of XML instance for spatial representation information (ISO 19115-1)

Identifier	https://standards.iso211.org/19115/-1/1/conf/metadata-xml/spatial-representation
Requirements class	Requirements class 12: XML implementation of spatial representation information (ISO 19115-1)
Prerequisites	Conformance class A.21: Validation of XML instance for citation, responsibility and party information (ISO 19115-1) Conformance class A.22: Validation of XML instance for common classes (ISO 19115-1) Conformance class A.26: XML package for GML Wrapper (ISO 19136)
Conformance tests	Conformance test A.52: Validate with XSD Conformance test A.53: Validate MD_Georectified instances with “checkPointAvailability” property provides description Conformance test A.54: Validate value of MD_GeometricObjects property “geometricObjectsCount”

Table A.64 — Conformance test A.52: Validate with XSD

Identifier	https://standards.iso211.org/19115/-1/1/conf/metadata-xml/spatial-representation/schema-valid
Requirement	Requirement 57: Valid spatial representation instance
Included in	Conformance class A.12: Validation of XML instance for spatial representation information (ISO 19115-1)
Test method	Validate with msr.xsd.

Table A.65 — Conformance test A.53: Validate MD_Georectified instances with “checkPointAvailability” property provides description

Identifier	https://standards.iso211.org/19115/-1/1/conf/metadata-xml/spatial-representation/georectified-check-point-description-value
Requirement	Requirement 58: MD_Georectified with “checkPointAvailability” property provides description
Included in	Conformance class A.12: Validation of XML instance for spatial representation information (ISO 19115-1)
Description	If the MD_Georectified element exists and has the property “checkPointAvailability” set to a value of 1, verify that the property of “checkPointDescription” is set.
Guidance	Automated code can be constructed to implement this conformance test.

Table A.66 — Conformance test A.54: Validate value of MD_GeometricObjects property “geometricObjectsCount”

Identifier	https://standards.iso211.org/19115/-1/1/conf/metadata-xml/spatial-representation/geometric-object-count-value
Requirement	Requirement 59: Valid value for MD_GeometricObjects property “geometricObjectsCount”
Included in	Conformance class A.12: Validation of XML instance for spatial representation information (ISO 19115-1)

Table A.66 (continued)

Test method	If the MD_GeometricObjects element exists and has the property “geometricObjectsCount”, check that its value is greater than 0.
Guidance	Automated code can be constructed to implement this conformance test.

Table A.67 — Conformance class A.13: Validation of XML instance for reference system information (ISO 19115-1)

Identifier	https://standards.iso211.org/19115/-1/1/conf/metadata-xml/reference-system
Requirements class	Requirements class 13: XML implementation of reference system information (ISO 19115-1)
Prerequisite	Conformance class A.22: Validation of XML instance for common classes (ISO 19115-1)
Conformance tests	Conformance test A.55: Validate with XSD Conformance test A.56: Valid MD_ReferenceSystem with identification properties Conformance test A.57: Valid MD_ReferenceSystem with property “crs”

Table A.68 — Conformance test A.55: Validate with XSD

Identifier	https://standards.iso211.org/19115/-1/1/conf/metadata-xml/reference-system/schema-valid
Requirement	Requirement 60: Valid application schema instance
Included in	Conformance class A.13: Validation of XML instance for reference system information (ISO 19115-1)
Test method	Validate with mrs.xsd.

Table A.69 — Conformance test A.56: Valid MD_ReferenceSystem with identification properties

Identifier	https://standards.iso211.org/19115/-1/1/conf/metadata-xml/reference-system/identifier
Requirement	Requirement 61: Valid MD_ReferenceSystem with identification properties
Included in	Conformance class A.13: Validation of XML instance for reference system information (ISO 19115-1)
Test method	If the MD_ReferenceSystem element exists, verify that least one of the properties “referenceSystemIdentifier” or “crs” is set.
Guidance	Automated code can be constructed to implement this conformance test.

Table A.70 — Conformance test A.57: Valid MD_ReferenceSystem with property “crs”

Identifier	https://standards.iso211.org/19115/-1/1/conf/metadata-xml/reference-system/coordinate-epoch
Requirement	Requirement 62: Valid MD_ReferenceSystem with property “crs” and CRS is dynamic
Included in	Conformance class A.13: Validation of XML instance for reference system information (ISO 19115-1)
Test method	If the MD_ReferenceSystem element exists and the property “crs” set, verify that the property “coordinateEpoch” is set.
Guidance	Automated code can be constructed to implement this conformance test.

Table A.71 — Conformance class A.14: Validation of XML instance for content information (ISO 19115-1)

Identifier	https://standards.iso211.org/19115/-1/1/conf/metadata-xml/content
Requirements class	Requirements class 14: XML implementation of content information (ISO 19115-1)

Table A.71 (continued)

Prerequisites	Conformance class A.21: Validation of XML instance for citation, responsibility and party information (ISO 19115-1) Conformance class A.22: Validation of XML instance for common classes (ISO 19115-1) Conformance class A.23: Validation of XML instance for multilingual support (language localization) (ISO 19115-1) Conformance class A.26: XML package for GML Wrapper (ISO 19136)
Conformance tests	Conformance test A.58: Validate with XSD Conformance test A.59: Validate with Schematron Conformance test A.60: Validate feature catalogue identification Conformance test A.61: Value of MD_ImageDescription property “illuminationElevationAngle” Conformance test A.62: Value of MD_ImageDescription property “illuminationAzimuthAngle” Conformance test A.63: Value of MD_ImageDescription property “cloudCoverPercent” Conformance test A.64: Validate MD_Band property “units” value Conformance test A.65: Validate MD_FeatureTypeInfo property “featureInstanceCount” value

Table A.72 — Conformance test A.58: Validate with XSD

Identifier	https://standards.iso/211.org/19115/-1/1/conf/metadata-xml/content/schema-valid
Requirement	Requirement 63: Valid content instance
Included in	Conformance class A.14: Validation of XML instance for content information (ISO 19115-1)
Test method	Validate with mrc.xsd.

Table A.73 — Conformance test A.59: Validate with Schematron

Identifier	https://standards.iso/211.org/19115/-1/1/conf/metadata-xml/content/schematron-rules
Requirements	Requirement 65: Inline feature catalogue of resource content instance Requirement 69: Value of MD_SampleDimension property “units” Requirement 64: Feature catalogue of resource content instance
Included in	Conformance class A.14: Validation of XML instance for content information (ISO 19115-1)
Test method	Validate with mrc.sch.
Guidance	This automated conformance test satisfies multiple requirements.

Table A.74 — Conformance test A.60: Validate feature catalogue identification

Identifier	https://standards.iso/211.org/19115/-1/1/conf/metadata-xml/content/feature-catalogue
Requirement	Requirement 64: Feature catalogue of resource content instance
Included in	Conformance class A.14: Validation of XML instance for content information (ISO 19115-1)
Test method	If an MD_FeatureCatalogueDescription exists, and no MD_FeatureCatalogue instance is included in the metadata record, verify that the MD_FeatureCatalogueDescription.featureCatalogueCitation property has been set.
Guidance	Automated code can be constructed to implement this conformance test.

Table A.75 — Conformance test A.61: Value of MD_ImageDescription property “illuminationElevationAngle”

Identifier	https://standards.iso211.org/19115/-1/1/conf/metadata-xml/content/image-illumination-elevation-angle-value
Requirement	Requirement 66: Value of MD_ImageDescription property “illuminationElevationAngle”
Included in	Conformance class A.14: Validation of XML instance for content information (ISO 19115-1)
Test method	If an MD_ImageDescription element exists, and has the property “illuminationElevationAngle”, check that the value is in the range –90 to +90.
Guidance	Automated code can be constructed to implement this conformance test.

Table A.76 — Conformance test A.62: Value of MD_ImageDescription property “illuminationAzimuthAngle”

Identifier	https://standards.iso211.org/19115/-1/1/conf/metadata-xml/content/image-illumination-azimuth-angle-value
Requirement	Requirement 67: Value of MD_ImageDescription property “illuminationAzimuthAngle”
Included in	Conformance class A.14: Validation of XML instance for content information (ISO 19115-1)
Test method	If an MD_ImageDescription element exists, and has the property “illuminationAzimuthAngle”, check that the value is in the range 0 to 360.
Guidance	Automated code can be constructed to implement this conformance test.

Table A.77 — Conformance test A.63: Value of MD_ImageDescription property “cloudCoverPercent”

Identifier	https://standards.iso211.org/19115/-1/1/conf/metadata-xml/content/image-cloud-cover-percent-value
Requirement	Requirement 68: Value of MD_ImageDescription property “cloudCoverPercent”
Included in	Conformance class A.14: Validation of XML instance for content information (ISO 19115-1)
Test method	If an MD_ImageDescription element exists, and has the property “cloudCoverPercent”, the value check that of which range 0.0 to 100.0.
Guidance	Automated code can be constructed to implement this conformance test.

Table A.78 — Conformance test A.64: Validate MD_Band property “units” value

Identifier	https://standards.iso211.org/19115/-1/1/conf/metadata-xml/content/band-units-value
Requirement	Requirement 70: Value of MD_Band property “units”
Included in	Conformance class A.14: Validation of XML instance for content information (ISO 19115-1)
Test method	If an MD_Band element exists, check that the value of the “units” property is a UomLength.
Guidance	Automated code can be constructed to implement this conformance test.

Table A.79 — Conformance test A.65: Validate MD_FeatureTypeInfo property “featureInstanceCount” value

Identifier	https://standards.iso211.org/19115/-1/1/conf/metadata-xml/content/feature-type-instance-count
Requirement	Requirement 71: Value of MD_FeatureTypeInfo property “featureInstanceCount”
Included in	Conformance class A.14: Validation of XML instance for content information (ISO 19115-1)
Test method	If MD_FeatureTypeInfo element exists and has the “featureInstanceCount” property, check that the value is greater than 0.
Guidance	Automated code can be constructed to implement this conformance test.