
**Geographic information — Procedures
for item registration —**

**Part 2:
XML schema implementation**

*Information géographique — Procédures pour l'enregistrement
d'éléments —*

Partie 2: Implémentation des schémas XML

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Published in Switzerland

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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

In other circumstances, particularly when there is an urgent market requirement for such documents, a technical committee may decide to publish other types of document:

- an ISO Publicly Available Specification (ISO/PAS) represents an agreement between technical experts in an ISO working group and is accepted for publication if it is approved by more than 50 % of the members of the parent committee casting a vote;
- an ISO Technical Specification (ISO/TS) represents an agreement between the members of a technical committee and is accepted for publication if it is approved by 2/3 of the members of the committee casting a vote.

An ISO/PAS or ISO/TS is reviewed after three years in order to decide whether it will be confirmed for a further three years, revised to become an International Standard, or withdrawn. If the ISO/PAS or ISO/TS is confirmed, it is reviewed again after a further three years, at which time it must either be transformed into an International Standard or be withdrawn.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO/TS 19135-2 was prepared by Technical Committee ISO/TC 211, *Geographic information/Geomatics*.

ISO 19135 consists of the following parts, under the general title *Geographic information — Procedures for item registration*:

- *Part 2: XML schema implementation* [Technical Specification]

A part 1 dealing with procedures for item registration is under preparation.

Introduction

The ISO 19135 series standardizes the procedures for the registration of geographic items. Since it does not provide any encoding for the storage and exchange of registers and register items, implementations may vary based on the interpretation of the base standard.

This Technical Specification defines an XML encoding for the storage and exchange of ISO 19135-compliant registers and register items. This encoding conforms to the rules described in ISO/TS 19139.

The encoding defined in this Technical Specification is intended to be extended to specific registers, e.g. ISO 19145¹⁾ for registers of representations of geographic point location.

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Geographic information — Procedures for item registration —

Part 2: XML schema implementation

1 Scope

This Technical Specification defines Geographic ReGister XML (grg) encoding, an XML schema implementation derived from ISO 19135.

2 Conformance

Conformance with this Technical Specification shall be checked using all the relevant tests specified in Annex A and all the relevant tests specified in Annex A of ISO/TS 19139:2007. The framework, concepts, and methodology for testing, and the criteria to be achieved to claim conformance, are specified in ISO 19105.

3 Normative references

The following referenced documents are indispensable for the application of this Technical Specification. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 19135:2005, *Geographic information — Procedures for item registration*

ISO/TS 19139:2007, *Geographic information — Metadata — XML schema implementation*

4 Terms and definitions

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

4.1 namespace

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

NOTE See Reference [5] in the Bibliography.

4.2 package

general purpose mechanism for organizing elements into groups

[ISO/TS 19103:2005, 4.2.22]

5 Abbreviations

UML Unified Modelling Language

URI Unique Resource Identifier

XCT XML Class Type

XML eXtensible Markup Language
 XSD XML Schema Definition

6 Introduction to the encoding descriptions

This Technical Specification defines Geographic ReGister (grg) XML encoding, an XML schema implementation of the register schema defined in Clause 8 of ISO 19135:2005. This XML schema implementation of ISO 19135 follows the encoding rules stated in ISO/TS 19139:2007, Clause 8. The exceptions and the implementations based on external types are detailed in this clause. This clause uses the UML notation commonly used in ISO geographic information standards and the specific notations defined in ISO/TS 19139:2007, 5.4.

In the list below, the item on the left describes the common namespace prefix used to describe the elements in the namespace. The second item is a description in English of the namespace prefix, and the item in parentheses is the URI of the actual namespace.

grg	Geographic ReGister	(http://www.isotc211.org/2005/grg)
gco	Geographic COmmon extensible markup language	(http://www.isotc211.org/2005/gco)
gmd	Geographic MetaData extensible markup language	(http://www.isotc211.org/2005/gmd)

7 XML namespaces

Figure 1 below shows the namespace used to implement ISO 19135 along with its dependencies on the namespaces defined in ISO/TS 19139 used to implement ISO 19115 and the related standards.

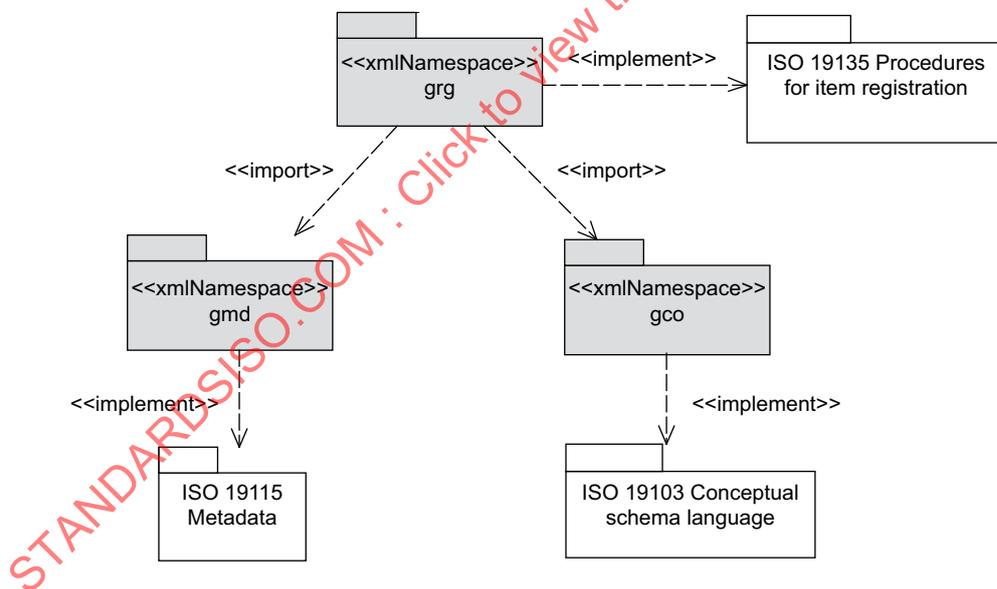


Figure 1 — XML namespaces

8 grg namespace

8.1 Organization of the grg namespace

This namespace contains the implementation of the register schema of ISO 19135. The root of this namespace is grg.xsd. Figure 2 shows the organization of the grg namespace.

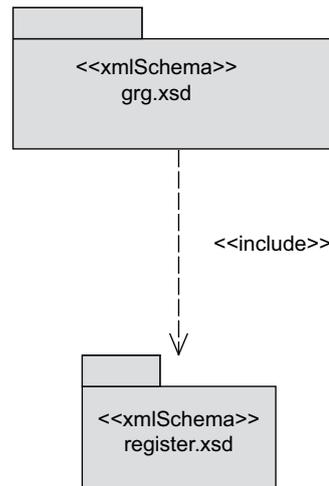


Figure 2 — Organization of grg namespace

8.2 grg.xsd

This XML schema includes directly all the implemented concepts of the grg namespace, but it does not contain the declaration of any type.

8.3 register.xsd

8.3.1 Introduction

This XML schema implements all the UML classes of the register schema defined in Clause 8 of ISO 19135:2005.

The UML classes defined in ISO 19135:2005, 8.2 and 8.7 to 8.24, are implemented in XML schema following the encoding rules defined in Clause 8 of ISO/TS 19139:2007. These classes are: RE_Register, RE_ReferenceSource, RE_RegisterItem, RE_ProposalManagementInformation, RE_AdditionInformation, RE_ClarificationInformation, RE_AmendmentInformation, RE_Reference, RE_SubregisterDescription, RE_AlternativeExpression, RE_AlternativeName, RE_Locale, RE_Version, RE_FieldOfApplication, RE_ItemStatus, RE_DecisionStatus, RE_Disposition, RE_AmendmentType and RE_SimilarityToSource.

Additionally, this XML schema contains two customized encodings, described in 8.3.2 and 8.3.3.

8.3.2 RE_RegisterOwner, RE_RegisterManager, and RE_SubmittingOrganization

An abstract element `grg:AbstractRegisterStakeholder` of type `grg:AbstractRegisterStakeholder_Type` is created to share the two common attributes of classes `RE_RegisterOwner`, `RE_RegisterManager`, `RE_SubmittingOrganization` defined in ISO 19135:2005, 8.3, 8.4 and 8.5. Their XML Class Type (XCT) derives from this abstract element, as depicted in Figure 3.

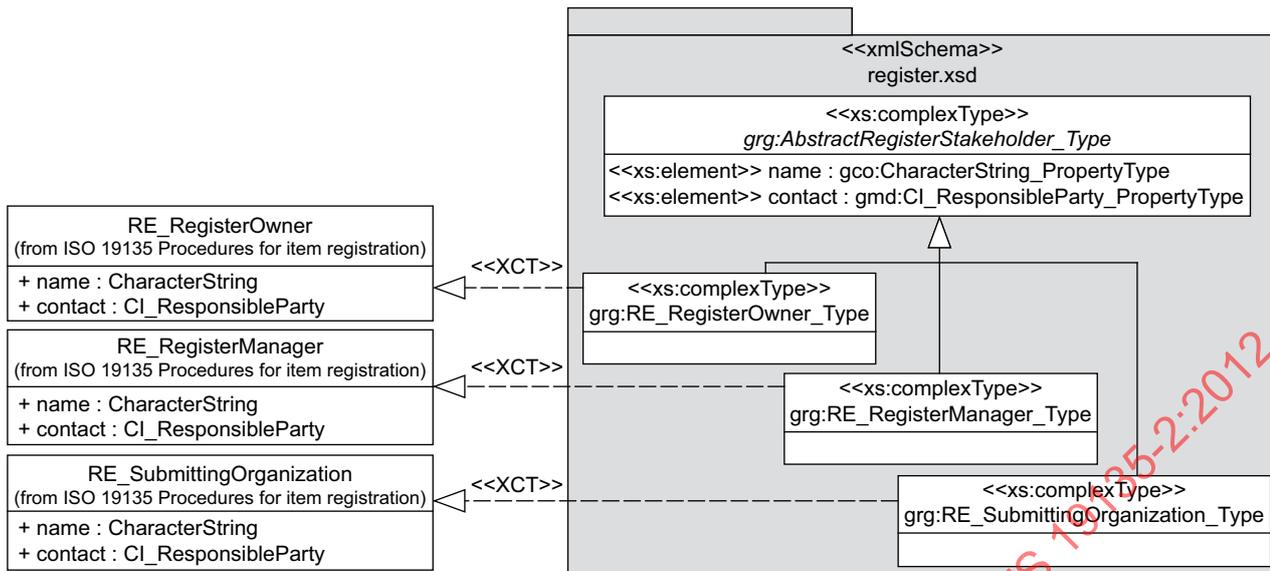


Figure 3 — Implementation of RE_RegisterOwner, RE_RegisterManager and RE_SubmittingOrganization

8.3.3 RE_ItemClass

ISO 19135:2005, 8.6.6, states that the *Categorization* association between RE_RegisterItem and RE_ItemClass shall be navigable from *describedItem* to *itemClass* but need not be navigable in the other direction. However, communities implementing ISO 19135 have identified a requirement to navigate from *itemClass* to *describedItem*. Since it is not prohibited by ISO 19135, this Technical Specification defines an encoding for *describedItem* as a role of RE_ItemClass. The XCT of RE_ItemClass contains an XML schema element implementing *describedItem*, as depicted in Figure 4.

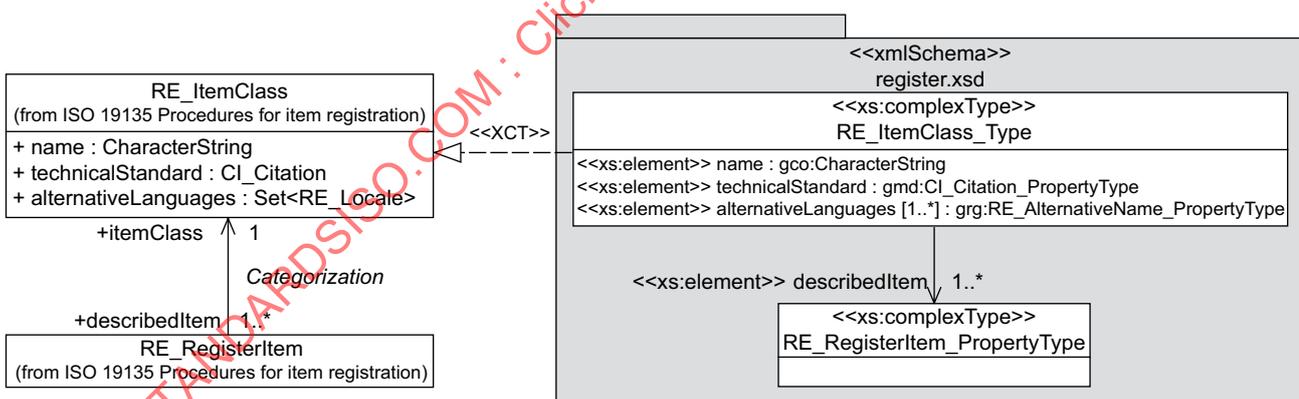


Figure 4 — Implementation of RE_ItemClass

Annex A (normative)

Abstract test suite

A.1 Introduction

This Technical Specification defines an XML schema encoding compliant with ISO/TS 19139. As such, this abstract test suite includes, by reference, the abstract test suite specified in ISO/TS 19139.

A.2 Overview of conformance test tools

Minimum conformance with this Technical Specification requires that geographic register and register item instance (XML) documents can be validated without error against the XML schemas defined by the encoding rules in Clause 8 of ISO/TS 19139:2007 and described in detail in Clause 8 of this Technical Specification. While many tools are available to test validation of XML instance documents against provided XML schemas, it is important to understand that not all validation tools implement the full W3C XML schema recommendation and not all validation tools interpret the W3C XML schema recommendation in the same manner. It is recommended that a tool with strict interpretation of XML schema and full support for the W3C XML schema recommendation be used to ensure conformance.

A.3 Conformance requirements — Constraints

XML schema 1.0 does not support the enforcement of certain types of constraints. For example, co-constraints such as the requirement that a register item with a “notValid” value on the “status” attribute implies a “notEmpty” value for the “dateAccepted” attribute cannot be enforced with XML schema. Document schema definition languages other than XML schema, e.g. Schematron or XSLT 2.0, should be used to implement these constraints. As a result, it is imperative that implementers heed the anchor notes shown in the figures of ISO 19135. Table A.1 shows the affected elements and the anchor notes and annotations.

Table A.1 — Conformance rules not enforceable with XML schema

Affected class	Conformance rule
RE_Register	countOf(version + dateOfLastChange) > = 1
RE_RegisterItem	status < > #notValid implies dateAccepted - > notEmpty status = #superseded or status = #retired implies dateAmended - > notEmpty
RE_RegisterItem	if exists - > (self.amendmentInformation.amendmentType = #retirement and self.amendmentInformation.disposition = #accepted and self.amendmentInformation.status = #final) then self.status = #retired else if exists - > (self.amendmentInformation.amendmentType = #supersession and self.amendmentInformation.disposition = #accepted and self.amendmentInformation.status = #final) then self.status = #superseded else if exists - > (self.additionInformation.disposition = #accepted and self.additionInformation.status = #final) then self.status = #valid else self.status = #notValid endif
RE_RegisterItem	specificationSource.similarity < = 3
RE_ProposalManagementInformation	status < > #pending implies disposition - > notEmpty status < > #pending implies dateDisposed - > notEmpty
RE_SubregisterDescription	self.itemClass.name = "Subregister" self.itemClass.technicalStandard.CI_Citation.title = "ISO 19135 Geographic information - Procedures for registration of items of geographic information" self.itemClass.technicalStandard.CI_Citation.alternateTitle = "ISO 19135:2005" self.itemClass.technicalStandard.CI_Citation.date.CI_Date.date = "2005" self.itemClass.technicalStandard.CI_Citation.otherCitationDetails = "Clause 8.14"
RE_Version	The attribute number shall be represented as a constrained CharacterString that denotes the version. The CharacterString shall be of the form < first positive integer > < dot > < second positive integer > < letter characters > ("#.##a"), where: a) < first positive integer > (one or more digits) shall specify the major version designation; b) < dot > (".") shall delimit the < first positive integer > from the < second positive integer > when there is a < second positive integer >; c) < second positive integer > (one or more digits) shall optionally specify the minor version designation; and d) < letters > (one or more characters) shall optionally specify the minor subversion designation.