

STN	Informačné modelovanie stavieb (BIM) Sémantické modelovanie a prepojenie (SML) Časť 2: Vzory modelovania špecifické pre doménu	STN EN 17632-2 73 9019
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Building information modelling (BIM) - Semantic modelling and linking (SML) - Part 2: Domain-specific modelling patterns

Táto norma obsahuje anglickú verziu európskej normy.

This standard includes the English version of the European Standard.

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Building information modelling (BIM) - Semantic modelling and linking (SML) - Part 2: Domain-specific modelling patterns

Modélisation d'informations de la construction (BIM) -
Modélisation et liaisons sémantiques (SML) - Partie 2 :
Patrons de modélisation spécifiques à un domaine

Bauwerksinformationsmodellierung (BIM) -
Semantische Modellierung und Verknüpfung (SML) -
Teil 2: Domänenspezifische Modellierungsmuster

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European foreword

This document (EN 17632-2:2024) has been prepared by Technical Committee CEN/TC 422 “Building information modelling (BIM)”, the secretariat of which is held by SN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by May 2025, and conflicting national standards shall be withdrawn at the latest by May 2025.

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Introduction

0.1 General

The abstract language and generic modelling patterns are already defined by the EN 17632-1.

Early practical industrial application showed that there is a 'gap' between these abstract/generic patterns and the real-world modelling needs in the built environment sector.

This document defines domain-specific extensions of the generic top-level information model defined in EN 17632-1. These extensions are especially relevant for the modelling of assets/products in the built environment. These standard extensions will support to close this gap.

This way, stakeholders in the built environment like owners, contractors and suppliers do not have to 'reinvent the wheel' for themselves for these new/extended modelling patterns.

By prescribing these patterns, stakeholders-specific data models will become even more pre-integrated easing future asset/product data exchange/sharing and data integration/innovation in findable, accessible, interoperable and reusable (FAIR) ways.

The extended standardized modelling patterns introduced in this document may be applicable to other industry sectors as well.

0.2 Extension with respect to part 1

The extended standard modelling patterns defined in this document (in bold below) can all be positioned in the global modelling framework provided in the form of a taxonomy by part 1. These concepts form the primary table of content of this part 2.

- TopConcept
 - AbstractConcept
 - Type
 - EnumerationType
 - ConceptType
 - Objectification
 - QualityValue
 - QuantityValue == **qudt:QuantityValue (with qudt:numericValue)**
 - RelationReference
 - **MatterPortion**
 - **ObservableProperty (SOSA)**
 - **Result (SOSA)**
 - **Sample (SOSA)**
 - ConcreteConcept
 - Entity
 - Object == **FeatureOfInterest (SOSA) == Feature (GeoSPARQL)**
 - PhysicalObject
 - **SpatialRegion**
 - **Interface**
 - **RealObject**
 - **DiscreteObject**
 - **Sensor (SOSA)**
 - **AmountOfBulkMatter**
 - **Matter**
 - **PureSubstance**
 - **ChemicalElement**
 - **ChemicalCompound**
 - **Mixture**
 - **HomogeneousMixture**
 - **HeterogenousMixture**
 - **Connection**
 - **Port**
 - InformationObject
 - Representation
 - GeometricEntity == **Geometry (GeoSPARQL)**
 - TemporalEntity
 - **Requirement**
 - Activity
 - **Interaction**
 - **Observation (SOSA)**
 - **Procedure (SOSA)**
 - **Function**
 - FunctionalEntity
 - **Function**
 - TechnicalEntity
 - PlannedEntity
 - RealizedEntity
 - State
 - Event

Figure 1 — extended standard modelling patterns defined in this document

NOTE 1 The reused SOSA and GeoSPARQL entities will be kept separate. That means that the actual supertypes as indicated above will not be modelled. Further end-user modelled domain-specific concepts can have multiple superclasses or their individuals can be multiply typed.

NOTE 2 Some of the information needs might be resolved by extending existing language level constructs (like in the case of implicit groups just adding some attributes for existing classes or containers or the use of SHACL rules to represent structured requirements coming from clients, building laws and regulations or from built environment sector recommendations). Finally, there is a lot of 'pattern potential' under 'DiscreteObject' and 'SpatialRegion' in the built environment (road networks, tunnels, bridges, buildings, installations). Care is taken not to cross existing standards boundaries.

1 Scope

This document (part 2) provides extended standard semantic modelling patterns for (at least) the following domain-specific asset aspects:

- support for distinction between two subtypes of physical objects: spatial regions and real (“tangible”) objects; the latter being discrete or continuous (“bulk matter”);
- support for the materialization of physical objects, adding generic chemistry aspects directly relevant for the built environment dealing with materials like concrete, steel, wood and asphalt;
- support for the interaction between objects including connections, interfaces and ports. Interactions being defined as activities where material, information, energy or forces are transferred;
- support for the definition of unstructured, human-interpretable, requirements, coming from appointing party needs, laws and regulations or sector recommendations;
- support for implicit groups having no explicit members (to model situations like “all main girders of some steel bridge”);
- support for the explicit modelling of measurements reusing the existing W3C SOSA ontology (as a lightweight but self-contained SSN core ontology);
- support for spatial geometry (location/shape) reusing OGC GeoSPARQL (GML/WKT) and the WGS84_pos ontology (GPS).

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 for this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 17632-1, *Building information modelling (BIM) — Semantic modelling and linking (SML) — Part 1: Generic modelling patterns*

ISO 6707-1, *Buildings and civil engineering works — Vocabulary — Part 1: General terms*

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