



BSI Standards Publication

Building information modelling (BIM) — Data templates for objects used in the life cycle of assets

National foreword

This British Standard is the UK implementation of EN ISO 23387:2025. It is identical to ISO 23387:2025. It supersedes BS EN ISO 23387:2020, which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee B/555, Construction design, modelling and data exchange.

A list of organizations represented on this committee can be obtained on request to its committee manager.

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Modélisation des informations de la construction (BIM)
- Modèles de données pour les objets utilisés durant le
cycle de vie des biens (ISO 23387:2025)

Bauwerksinformationsmodellierung (BIM) -
Datenvorlagen für Objekte während des Lebenszyklus
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European foreword

This document (EN ISO 23387:2025) has been prepared by Technical Committee ISO/TC 59 "Buildings and civil engineering works " in collaboration with Technical Committee CEN/TC 442 "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of an identical text or by endorsement, at the latest by April 2026, and conflicting national standards shall be withdrawn at the latest by April 2026.

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

This document supersedes EN ISO 23387:2020.

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Endorsement notice

The text of ISO 23387:2025 has been approved by CEN as EN ISO 23387:2025 without any modification.

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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 documents 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).

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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 <http://www.iso.org/iso/foreword.html>.

This document was prepared by Technical Committee ISO/TC 59, *Buildings and civil engineering works*, Subcommittee SC 13, *Organization and digitization of information about buildings and civil engineering works, including building information modelling (BIM)*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 442, *Building Information Modelling (BIM)*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This second edition cancels and replaces the first edition (ISO 23387:2020), which has been technically revised.

The main changes are as follows:

- the data model has been harmonised with ISO 12006-3:2022;
- an XML Schema Definition has been provided.

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.

Introduction

Building information modelling (BIM) provides a digital process for describing and displaying information required in the planning, design, construction and operation of assets. This approach encompasses all aspects of the built environment, including civil infrastructure, utilities and public space.

The ISO 19650 series sets out the concepts and principles for business processes across the built environment sector in support of the management and production of information during the life cycle of assets when using building information modelling (BIM). To support the management and production of information in these business processes, standardization is of the highest importance. Machine-interpretable data are essential to providing a reliable and sustainable exchange of information in an asset life cycle process.

Data templates provide a standardized data structure to describe the characteristics of objects enabling seamless information exchanges of construction sector business semantics through the life cycle of assets.

This document enables data templates to be standardized and made available across the built environment sector, and where applicable through data dictionaries based on ISO 12006-3.

Data templates can be used in conjunction with Industry Foundation Classes (IFC) in ISO 16739-1.

The target audience of this document is:

- software developers, for embedding the data structure in software, platform etc.;
- built environment sector domain experts appointed to create data templates based on sources describing information needs;
- sector practitioners, as they provide the demand, use of data, and process etc.;
- authorities, as they review and check all relevant submissions;
- research and development personnel, as they support the innovation and continuous development of data templates;
- educational institutions, as the concept of data templates, same as BIM, and digital information principles should be merged into education and training programs;
- developers (asset owners), as they need a clearer vision on data template, hence to put this as part of the tender documents.

Building information modelling (BIM) — Data templates for objects used in the life cycle of assets

1 Scope

This document provides the concept of data templates developed to enable machine interpretability based on a standardized data structure, carrying the alphanumerical information for any object used in the life cycle of assets.

This document provides a description of how data templates are implemented following ISO 12006-3.

This document provides a methodology to create and maintain data templates in data dictionary.

This document provides guidance for linking between data templates and classification systems within data dictionaries based on ISO 12006-3.

This document provides an XML Schema Definition (XSD) representing an implementation of the ISO 23387 and ISO 12006-3 data models.

It is not within the scope of this document to provide the content of any data templates.

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 23386, *Building information modelling and other digital processes used in construction — Methodology to describe, author and maintain properties in interconnected data dictionaries*

ISO 12006-3, *Building construction — Organization of information about construction works — Part 3: Framework for object-oriented information*

3 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

data dictionary

database that contains metadata

[SOURCE: ISO/IEC 2382:2015, 2121501, modified — The admitted term "information resource dictionary" has been removed; notes to entry have been removed.]

3.2 data template

data structure used to describe the characteristics of *objects* (3.4)

EXAMPLE 1 A data template offers a view tailored to a specific information requirement. For example, a heating, ventilation and air conditioning (HVAC) *system* (3.11) designer may require descriptions of HVAC products that can be imported into the design system.

EXAMPLE 2 A data template provides manufacturers with a standardized data structure that can be applied to any internal system or process, or both, of handling product data. For example, one or several product information management systems can apply or map to this structure to enable machine interpretability, both internally and with any requests from any software using the same data template structure. An HVAC product manufacturer can then answer the request from any stakeholder including the HVAC system designer.

Note 1 to entry: The relevant scope of the data template can be used together with the term “data template”. For example, a data template for a *product* (3.8) can be named “product data template”; a data template for a system can be named “system data template”.

Note 2 to entry: A data template can be used in an information exchange for a specific purpose for an *object type* (3.5) in the inception, brief, design, production, operation and demolition of assets.

3.3 data sheet

data input in accordance with a *data template* (3.2), that represents a real-world *product* (3.8), asset or requirement

EXAMPLE 1 Product using *property* (3.9) “thermal transmittance” with unit $W/(m^2 \cdot K)$ is of value 0,9.

EXAMPLE 2 Requirement using *property* “height” with unit mm is of value 600.

3.4 object

any part of the perceivable or conceivable world

EXAMPLE Instance of a “calcium silicate masonry unit” *object type* (3.5).

Note 1 to entry: An object may represent a design object, intermediate *product* (3.8), finished product, finishing tool or equipment, *system* (3.11), assembly, space, building, etc.

[SOURCE: ISO 12006-2:2015, 3.1.1, modified — The original note 1 to entry has been replaced by a new one, EXAMPLE has been added.]

3.5 object type

representation of *objects* (3.4) that share common characteristics

Note 1 to entry: The role of the object type is to classify the *data template* (3.2).

3.6 group of properties

collection of *properties* (3.9) enabling them to be prearranged or organized

[SOURCE: ISO 23386:2020, 3.14, modified — The definition has been updated to clarify that the collection is for properties; notes to entry have been removed.]

3.7 machine-interpretable data

data that is in a specific context and format and can be read and stored in a computer *system* (3.11) such that action can be taken based on the content of the data

[SOURCE: ISO 10303-232:2002, 3.5.3, modified — The preferred term has been changed from “computer interpretable data” to “machine-interpretable data”; “may” has been replaced by “can”; EXAMPLE has been removed.]

3.8

product

item manufactured or processed for incorporation in construction works

[SOURCE: ISO 6707-1:2020, 3.4.1.2, modified — The preferred term "construction product" has been removed; note 1 to entry has been removed.]

3.9

property

defined characteristic suitable for the description and differentiation of an *object* ([3.4](#))

EXAMPLE Length according to EN 12058, sound reduction index according to ISO 10140-4.

Note 1 to entry: When a property is named together with reference to a technical specification, where the instructions to assess the performance are available (usually standards), it is to be regarded as a specific property. The relationship between the property and the specific property is modelled as a parent child relationship.

[SOURCE: ISO 22274:2013, 3.25, modified — The words "the objects in a class" have been replaced with "an object"; EXAMPLE has been replaced; note 1 to entry has been added.]

3.10

reference document

publication that is consulted to find specific information, particularly in a technical or scientific domain

EXAMPLE EN 771-1:2011+A1:2015.

Note 1 to entry: A reference document can be associated with any data present in a *data dictionary* ([3.1](#)).

[SOURCE: ISO 23386:2020, 3.18, modified — EXAMPLE has been added.]

3.11

system

arrangement of parts or elements that together exhibit a stated behaviour or meaning that the individual constituents do not

EXAMPLE The object "wall" which is composed of parts is a system.

[SOURCE: ISO/IEC/IEEE 15288:2023, 3.46, modified — EXAMPLE has been added; notes 1 to 3 to entry have been removed.]

4 Data template structure

4.1 General

The objective of data templates is a common way to exchange object data. Therefore, all data templates follow the same general data structure (meta model). A data template is meant to provide a standardized structure for a pre-defined information delivery – a data sheet – for an object type, for a specific use case or any other purpose.

The data template structure consists of the concepts object type, data template, property, reference document, and group of properties. Quantities, units and values are attributes of the properties, according to ISO 12006-3, and therefore not modelled as separate concepts in the UML model in [Figure 1](#).

Where relevant, the data template has a relationship to an object type. Depending on the purpose of the information exchange, it is possible to create multiple data templates for one object type, having common or disjoint properties.

Both data templates and groups of properties can be used for providing a pre-defined information delivery. For example, the geometrical properties "width", "length" and "height" can be collected under the group of properties "dimensions". Which of the concepts to use depends on the purpose of the information delivery and the intended behaviour of the data sheet.

All the concepts of a data template may have a relationship to an external document such as a standard, a technical specification, report, guideline or similar. The reference document provides the definition of the concept element. A few more relationships exist which are illustrated in [Figure 1](#).

Object types, data templates, properties, groups of properties, and reference documents are all concepts that are created, managed and stored within a data dictionary. The data dictionary implementation shall be based on ISO 12006-3. All concepts in this document shall be created following the management rules to author and maintain properties and groups of properties as defined in ISO 23386. The governance of data dictionaries prevents duplication, while providing clear definitions of all concepts in data templates.

As ISO 12006-3 supports interconnections of data dictionaries, a data template can use concepts accordingly. Therefore, a data template can be composed by concepts from different data dictionaries. This is illustrated in [Clause A.1](#).

A data template applies to both single object types and systems or compositions of object types. For example, a data template applies to a window as a single object type, but also to a window with its components. It also applies to a system incorporating the window, like an external wall system. An example of a wall system with components is given in [Clause A.4](#).

A data template applies to object types representing any part(s) of the object life cycle, from early design, through specification, and for physical objects (products or system of products). Where applicable, definitions of object types and properties should be reused throughout the object life cycle.

4.2 UML representation of a data template structure

The data template representation in [Figure 1](#) uses the Unified Modelling Language (UML). [Figure 1](#) provides modelling rules for concepts and their relationships. In addition to UML relationships, names are added to them to provide relationship semantics, corresponding to ISO 12006-3, explained in [Table 3](#).

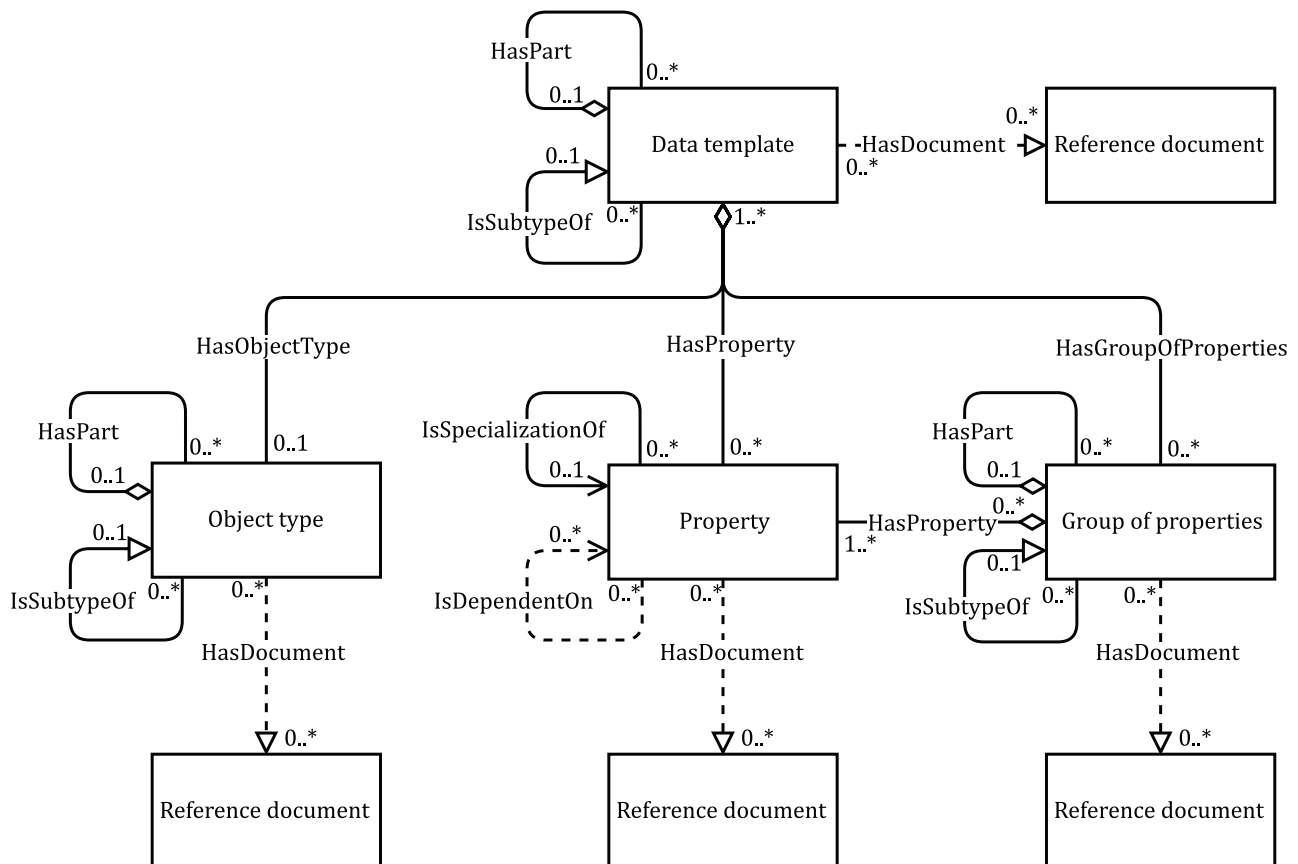


Figure 1 — UML representation of a data template structure

4.3 URIs usage for ISO 23887 data model

This document introduces an additional attribute that is applicable to all concepts in a data template, the URI, which can be used alongside the UUID which is mandatory in ISO 12006-3. UUIDs may be incorporated into URIs where relevant, but this is not mandatory, particularly when URIs can include user-friendly information.

UUIDs are primarily intended for internal references within a data dictionary, ensuring unique and consistent identification. While UUIDs can serve as external references in scenarios where defining URIs is impractical, this approach is not recommended. URIs are generally preferred for external references due to their flexibility and ability to convey meaningful information. Consequently, URIs should be prioritized for external referencing whenever feasible.

4.4 Data modelling

4.4.1 General

The data template structure consists of a data template that has an object type, properties, and groups of properties, with reference documents providing the source of each of the concepts.

A data template is modelled within the context of one object type to provide a pre-defined information delivery.

One object type may be assigned to several data templates. Each data template may contain one or more properties, and within each data template the properties can be collected in different groups of properties.

The rules for modelling the data template structure with its concepts apply within the context of one data template. The modelling rules in [Figure 1](#) are described in [4.4.2](#) to [4.4.6](#).

[Annex A](#) provides examples of possible data modelling approaches, together with use cases and examples.

[Annex B](#) provides a possible workflow for creating data templates.

[Annex C](#) provides examples of data template concepts' attributes.

4.4.2 Reference document

A reference document may be related to several object types, data templates, groups of properties, and properties. Therefore, the modelling rules are zero to many (0..*) data templates, groups of properties, and properties.

4.4.3 Object type

The object type:

- a) should ideally be defined based on a standard (terminology standard, technical standard, etc.); however, this is not mandatory as an object type may be defined in other sources than standards; the object type can be defined in several reference documents; the modelling rule is zero to many (0..*) reference documents;
- b) needs a data template to relate properties to it; one object type can belong to multiple data templates; the modelling rule is one to many (1..*) data templates;

EXAMPLE 1 An object type can belong to multiple data templates when it is part of a system. A more detailed example is provided in [Figure A.5](#).

- c) can be composed of (has part relationship) other object types; the modelling rule is zero to many (0..*) object types;

EXAMPLE 2 A wall is composed of layers of products.

- d) can be part of the composition of another object type; within the context of one object type, this can be maximum one object type; the modelling rule is zero to one (0..1) object type.

4.4.4 Data template

The data template:

- a) defines a complete and unique information delivery within a context or with a specific purpose;
- b) has a list of unique properties; the modelling rule is zero to many (0..*) properties;

EXAMPLE 1 A design specification is a data template.

EXAMPLE 2 A delivery ticket is a data template

- c) may have groups of properties to allow for categorization of properties within the data template to provide subsets of the template properties, fulfil part(s) of the data template overall purpose, or fulfil any other specific information need, the modelling rule is zero to many (0..*) groups of properties;
- d) can be related to an object type, the modelling rule is zero to one (0..1) object types;
- e) can be based on one or more reference documents, the modelling rule is zero to many (0..*) reference document;

EXAMPLE 3 A reference document for a template can be a design or product standard, or another technical specification.

- f) can be composed of (has part relationship) other data template concepts; the modelling rule is zero to many (0..*) data template;

EXAMPLE 4 A data template can be composed of other data template e.g. when a wall is composed of layers of materials or products. An example is provided in [Figure A.5](#).

- g) can be part of the composition of another data template concept, within the context of one data template, this can be maximum one data template concept; the modelling rule is zero to one (0..1) data template concepts.

4.4.5 Group of properties

The group of properties:

- a) defines a common context or purpose for a collection of properties;

EXAMPLE 1 Properties within one data template relevant to different domains or recipients, such as technical, financial and environmental properties, can be collected in different groups of properties based on the domain.

EXAMPLE 2 Within a data sheet, properties necessary at different times or stages during a construction process may be collected in groups of properties if the property values remain constant over time or across stages.

- b) shall at a minimum have one property, the modelling rule is one to many (1..*) properties;
- c) shall be related to a data template and it can be related to multiple data templates; the modelling rule is one to many (1..*) data templates;
- d) can be based on one or more reference documents, e.g. a design or product standard, or another technical specification; the modelling rule is zero to many (0..*) reference documents;
- e) can be composed of (has part relationship) other groups of properties, the modelling rule is zero to many (0..*) groups of properties;
- f) can maximum be part of one group of properties, within the context of one group of properties; the modelling rule is zero to one (0..1) groups of properties.