

ICS 35.240.30

CCS L 70



**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 47462-2026

**Digital standards - Architecture of the standard information
model**

数字标准 标准信息模型架构

Issued on: April 30, 2026

Implemented on: November 1, 2026

**Issued by: State Administration for Market Regulation;
Standardization Administration of the PRC**

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2 Structural Information Unit Architecture

7.1.2 Previous Page Information The front page information includes the cover, preface, and introduction, each described as follows:

---The cover information includes key standard document information, such as standard name, standard category, standard number, publication date, implementation date, and standard document information. Authorized issuing agencies, etc.;

---The preface includes information on the standard's development and revision, appendix descriptions, the organization that proposed the standard, the organization responsible for the standard, and the organization that drafted the standard. The standard's drafters, its relationship with international standards, and the publication history of the document and any versions of the documents that it has replaced or repealed;

---The introduction section contains standard background information, usually expressed in paragraphs.

7.1.3 Main Text Information The main body of the standard generally includes its scope, normative references, terms and definitions, symbols and abbreviations, and technical elements. (Each section...) The explanation is as follows:

---Scope. This section covers information such as the standardized objects and their applicable scope; detailed information is presented in paragraphs.

---Normative references. These include information on other standards referenced in the clauses of this standard. The standard number and name should be clearly indicated. Line references and structured storage;

---Terms and Definitions. Covers entry numbers, terms, English equivalents, definitions, etc.;

---Symbols and Abbreviations. A data combination encompassing symbols and their explanations, abbreviations, full English names, and their Chinese meanings;

---Technical Elements. Covering the main technical requirements of the standard, expressed in a structured manner through chapters, clauses, paragraphs, lists, figures, tables, etc. For example, the information that needs to be processed and marked includes table number, table title, statements about units, table header, table body, footnotes, notes, etc. See Figure 3. Figure

3 Information Structure

7.1.4 Information on subsequent pages The following pages include appendices and references. The data presented in the appendix follows the same technical format as the main text. References... References mainly include information such as document number and document title.

4 Organization of semantic information units in metallic material standards

8.1.3 The domain model of standardized objects is centered on business scenarios, extracting typical business processes, rules, and interaction logic, and incorporating complex business requirements. The goal is to transform the logical framework into a hierarchical semantic representation (such as a concept layer, rule layer, and instance layer), and to ensure its alignment with business specifications through expert verification. Strong coupling. Example. Building standard semantic information units are organized using Building Information Modeling (BIM), which is a domain model for the construction industry. For example, GB 50016- In.2014, it was proposed that "exits should be distributed in a dispersed manner, with the horizontal distance between the nearest edges of adjacent exits $\geq 5\text{m}$." In Building Information Modeling (BIM), this is achieved by defining safety exit components... The clause is embodied in attributes and spatial relationships. Emergency exits are set as specific model elements, given the semantic label "Emergency Exit," and their horizontal position is defined. Set geometric properties such as coordinates. Utilize the BIM model's rule engine to set constraints, specifically the horizontal distance between two model elements labeled "Emergency Exit". The distance attribute value is greater than or

equal to 5m. The semantic information unit organization of building components is shown in Figure 5. Figure

5 Overall Architecture

The standard information model architecture is shown in Figure 1, and consists of the following four parts.

---Standard Management Shell. This is the entry point for accessing the standard information model, providing management metadata and indexes for digital standards, content interfaces, and... The functional interface, wherein the content interface defines the markup language used to acquire and interpret structural and semantic information units. The signature type and version, and the functional interface define the service entry point for the functional information unit;

---Structured Information Unit. Represents and stores structured standard information, supporting selective access to standard content;

---Semantic Information Unit. Represents and stores the semantic characteristics and requirements of standard structured information units. Structured information units are implemented through an ontology model. Semantic information units can be obtained by mapping from a domain model, supporting the processing of semantic information units according to standardized ontology characteristics or application domain characteristics. Meta-aggregation, intelligent reasoning, and push notifications;

---Functional information unit. This is a combination and diversified expression of structural information units and semantic information units, tailored to different business application scenarios. It provides executable standard service capabilities, presenting different application forms such as models, components, programs, and interfaces.

6.1 Managing Metadata and Indexes

6.1.1 Managing Metadata The management metadata in the management shell provides user terminals (such as machines/software) with the data types included in the digital standard, which the user terminals can then access. To access and obtain the required data through valid metadata tags. The metadata set is derived from the collection and organization of all tags in the structural information units and semantic information units of the digital standard.

6.1.2 Index Indexes are used to support retrieval and querying of numerical standards, and mainly include:

---Standard number;

---release date;

- Issuing organization;
- Standard state;
- Implementation or trial date;
- Confirmation date;
- Drafting unit;
- Standard Chinese Name;
- Standard English name;
- The standard that was replaced;
- Standard type;
- Submitting Unit;

7.1 Information Organization

7.1.1 Structural Information Unit Architecture The structural information unit architecture is shown in Figure 2.

Note. The chapter, section, paragraph, and item hierarchy may contain figures, tables, mathematical formulas, examples, notes, footnotes, citations, etc. Figure

7.2 Information Construction

7.2.1 The digital representation of structural information units should adopt published and consensus-reaching specifications and standards to ensure standard data compatibility and interoperability. Based on this, supplement relevant metadata and tags from national, industry, and international standards as needed.

7.2.2 The digital representation of structural information units shall conform to GB/T 46687.2.

7.2.3 Formulas in structural information units shall conform to MathML or LaTeX syntax rules, and terms and definitions shall conform to GB/T 44227. Refer to XHTML syntax rules.

8.1 Information Organization

8.1.1 Semantic information units can be organized according to the ontology model or domain model of standardized objects.

8.1.2 The ontology model of standardized objects can extract structured elements, such as entities, relationships, and constraints, by parsing the object semantics of relevant standards. A top-down ontology modeling approach is adopted to construct a hierarchical model. Example. The organization of semantic information units in material standards