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Data structures for electronic product catalogues for building services - Part 5: Product catalogue exchange format (ISO/DIS 16757-5:2024)

Datenstrukturen für elektronische Produktkataloge der Technischen Gebäudeausrüstung - Teil 5: Austauschformat für Produktkataloge (ISO/DIS 16757-5:2024)

Structures de données pour catalogues électroniques de produits pour les services du bâtiment - Partie 5: Format d'échange pour les catalogues de produits (ISO/DIS 16757-5:2024)

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Data structures for electronic product catalogues for building services —

Part 5: Product catalogue exchange format

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European foreword

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of an identical text or by endorsement, at the latest by (Month/Year) and conflicting national standards shall be withdrawn at the latest by (Month/Year).

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in ISO/IEC Directives, Part 2, 2016.

SHALL is the strongest expression (Requirement)

MAY is to permit something

MUST means something to apply for legal reasons

CAN expresses a possibility

SHOULD is a recommendation

Requirements – shall, shall not

Recommendations – should, should not

Permission – may, need not

Possibility and capability – can, cannot

Introduction

Building information modelling (BIM) provides a digital technology for describing and displaying information required in the planning, design, construction and operation of constructed facilities. Increasingly this modelling approach is expanding to encompass all aspects of the built environment, including civil infrastructure, utilities and public space.

The standard EN ISO 16757 defines the structure of a product catalogue model for data sharing and data exchange of product models in catalogues. It contents the definitions for:

— Deliverable products determined by their product classes, product variants and property values

— Products combined of components and accessories

— Geometrical product representation in technical systems

— Connectivity to other products in models of technical systems

— Calculation of dynamic property values according to the product behaviour in technical systems

The standard EN ISO 16757 consists of the following standards:

- **EN ISO 16757-1:2015: Data structures for electronic building services product catalogues — Concepts, architecture and model**

This part of the standard describes the fundamental concepts and assumptions about the creation of manufacturer-related product catalogues as BIM data exchange models. It describes the content of catalogues and the mapping of the content to a data format.

This data format offers the possibility to read product data together with accessory data into software applications for planning, designing, calculating and simulating as well as for facility management.

- **EN ISO 16757-2:2017: Data structures for electronic building services product catalogues — Geometry**

This part of the standard describes the concept of geometry of the Building Services product data of a catalogue in form of 2D/3D symbols and 3D shape models and specifies the required spaces and ports.

It contains the fundamental concepts and assumptions about the parametric geometry of special products, used in planning software applications for example for air condition systems such as ducts and transitions between different forms. It also includes a concept for representing products as 3D solid models made from thin sheet metal.

- **EN ISO 16757-4 (E): Data structures for electronic building services product catalogues — Dictionaries for product catalogues**

This part of the standard describes which data structures are required in a dictionary to support the exchange of product data from manufacturers to designers of building services systems. In addition to the “normal” requirements for dictionaries (unique identification of classes and properties), the following requirements must be supported:

— Definition of properties that are used for defining the product variants

— Definition of (reusable and multiply used) blocks

— Definition of property dependencies (dynamic properties)

In this part of the standard, these requirements are defined:

— A model for capturing the necessary structures is defined.

— A mapping to the dictionary model of ISO 12006-3 is provided.

- **EN ISO 16757-5 (E): Data structures for electronic building services product catalogues — Product catalogue exchange format (This part of the standard here)**

Data structures for electronic product catalogues for building services —

Part 5:
Product catalogue exchange format

1 Scope

This part of the standard – EN ISO 16757 Part 5: Product catalogue exchange format - describes how product catalogue data for building services products is exchanged by means of a specific IFC MVD from manufacturers to designers of building services systems.

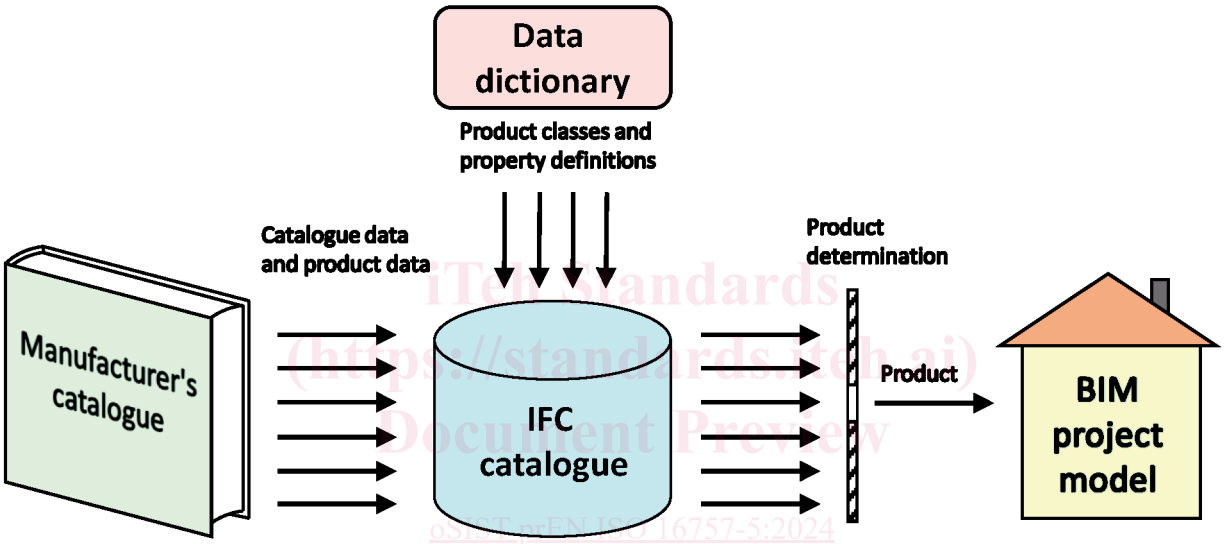

Figure 1 — From the manufacturer's catalogue via IFC-catalogue to the BIM project model

With EN ISO 16739-1:2020, an open language exists for the creation, transfer and maintenance of design models.

The standard EN 17549-2 defines the data exchange of scalable product properties within IFC. It represents a simplification of EN ISO 16739-1:2020 from an information technology perspective and as such is a Model View Definition (MVD). It focuses on core classes and relies on external data dictionaries to describe business semantics.

This part of the standard EN ISO 16757 completes the description of the IFC-based data exchange format for manufacturer catalogues including the parametric properties of for example:

— Catalogue metadata

— Product classes

— Constraints for parametric data

— Product accessory structures

— Constraints for assembling composable products and accessories

- Reusable and multiply used data blocks
- Product properties as defined in the related dictionary
- Static product properties
- Dynamic computable product properties
- Port properties as defined in the related dictionary
- Geometric data of product spaces
- Geometric data of product symbols
- Geometric data of product shape
- Geometric data of product ports
- Geometric data of product openings
- Part numbers

This standard is aimed at both software manufacturers for the construction sector and professionals in the sector who use their software.

This part of the standard focuses only on the format of the data exchanged and not on how to process it. Notes on the implementation of the standard in application software can be found in the (non-normative) Annex B.

This standard does not (!) directly lead to an automatic selection of products.

The product data catalogue does not contain any decision criteria for this. However, the data of a catalogue could be searched by application programs looking for a suitable product size.

According to EN ISO 16757 Part 4, this standard does not provide a data template, as it assumes that these are already defined in data dictionaries according to EN ISO 12006-3.

This part of the EN ISO 16757 standard describes the overall scope of the types of data that can be transmitted, and the form of transmission.

Specialist planners of complete systems for building services, for example, will expect almost all of this data in the catalogue, as they require the shape data for dimensioning and clash detection in addition to the technical design and setting of the products.

However, there are also special applications that only require individual property values (for example the weight and space requirement for transport planning). For these purposes, different extensive templates according to EN ISO 16757 Part 4 are set up.

2 Normative references

The standard EN ISO 16757 uses the following standards:

EN ISO 16739:2020, *Industry Foundation Classes (IFC) for data sharing in the construction and facility management industries*

EN ISO 17549-2:2021, *Building information modelling – Information structure based on EN ISO 16739-1:2020 to exchange data templates and data sheets for construction objects — Part 2: Configurable construction objects and requirements*

The following referenced documents are indispensable for the application 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.

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

EN ISO 16739, *Industry Foundation Classes (IFC) for data sharing in the construction and facility management industries*

ISO 10303-42, *Industrial automation systems and integration — Product data representation and exchange — Part 42: Integrated generic resource: Geometric and topological representation*

EN ISO 16739, *Industry Foundation Classes (IFC) for data sharing in the construction and facility management industries*

prEN ISO 17549-2:2021, *Building information modelling – Information structure based on EN ISO 16739-1:2020 to exchange data templates and data sheets for construction objects — Part 2: Configurable construction objects and requirements*

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

ISO 80000, *— Quantities and units*

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

3 Terms and definitions

For this document, the terms and definitions given in ISO 6707-1 and the following apply.

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

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at http://www.electropedia.org

3.01
accessory
product of the same or of different product groups, which can be attached to a product

Note 1 to entry: An accessory is not a different type of product, it plays an ancillary role to another product.

3.02
article number
manufacturer's reference number, GTIN, or other identifier identifying the product or constituents of a product

3.03
attribute
data element for the computer-sensible description of a property, a relation, or a class

[SOURCE: ISO 22274:2013, 3.2]

3.04
building information modelling (BIM)
construction of a model that contains the information about a building for all phases of the building life cycle

Note 1 to entry: In many cases, the abbreviation BIM is also used for the result of the building information modelling, namely the building information model.

3.05
building services (BS)
utilities and installations supplied and distributed within a building such as electricity, gas, heating, water, and communications

[SOURCE: ISO 16484-2]

3.06
building services system (BSS)
technical system that provides building services in a building

[SOURCE: ISO 16484-2]

3.07
BSS property
technical property that describes an aspect of the current state of a BSS

Note 1 to entry: A BSS property cannot get a value in a catalogue because the states of the building services system are not known and will vary according to the specific system and its various system states. ISO 16757-1:2015(E).

EXAMPLE In the example given in 2.10, 'media volume flow' and 'media density' are BSS properties.

3.08
catalogue metadata
data in the catalogue which contains data about the catalogue itself

EXAMPLE Catalogue metadata include standard numbers, data for version management, the manufacturer's name, and global location number, as well as file check details.

3.09
configurable construction object
construction object for which some properties have no explicit values but are implicitly defined by constraints

3.10
constraint
logical expression that restricts the possible values for one or several properties

3.11
construction object
object of importance to the construction industry

3.12
construction object data view 2 (CODview-2)
technical Model View Definition that defines a comprehensive digital structure to store and exchange configurable objects and requirements data for Building Information Modelling

[SOURCE: EN ISO 17549-2:2021]

3.13
data dictionary
centralized repository of information about data such as meaning, relationships to other data, origin, usage, and format

[SOURCE: EN ISO 23386:2019]

3.14
data sheet
populated data template

3.15
data template
schema providing a data structure used to describe the properties of construction objects[SOURCE:

[SOURCE: EN ISO 23387:2019]