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Data structures for electronic product catalogues for building services —

Part 5: Product catalogue exchange format

Structures de données pour catalogues électroniques de produits pour les services du bâtiment —

Partie 5: Format d'échange des catalogues de produits

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Foreword

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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 document 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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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).

A list of all parts in the ISO 16757 series can be found on the ISO website.

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.

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Introduction

Building information modelling (BIM) provides a means for describing and displaying information required throughout the asset life cycle. Increasingly this modelling approach is expanding to encompass all aspects of the built environment, including civil infrastructure, utilities and public space.

The ISO 16757 series provides the structure of a product catalogue model for data sharing and data exchange of product models in product catalogues. It contains specifications for:

— selection of products from different product classes and product variants;

— combining product components and accessories to products;

— geometrical representation in technical systems;

— connectivity to other products in models of technical systems;

— calculation of dynamic property values in accordance with the product behaviour in technical systems.

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

This data format provides the opportunity to search and select product data together with accessory data which can be read into software applications for planning, designing, calculating and simulating as well as for facility managing.

This document 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 Annex B.

This document does not directly lead to an automatic selection of products.

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

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

Besides this document, the ISO 16757 series contains the following documents:

— ISO 16757-1 describes the fundamental concepts and assumptions about the creation of manufacturer-related product catalogues as BIM data exchange models. It describes the content of product catalogues and the mapping of the content to a data format.

  This data format provides the opportunity to search and select product data together with accessory data which can be read into software applications for planning, designing, calculating and simulating as well as for facility management.

— ISO 16757-2 describes the concept of geometry of the building services product data of a product catalogue in form of 2D or 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, e.g. for air conditioning systems such as ducts and transitions between different forms. It also contains a concept for representing products as 3D solid models made from thin sheet metal.

— ISO 16757-4 describes the data structures that are required in a data dictionary to support the exchange of product data from manufacturers to designers of building services systems.

  It defines subject kinds to distinguish subjects representing products from subjects representing features of products like ports and in/outlets, it defines relationship types and a number of property

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kinds, in particular dynamic properties for the description of the behaviour of a product under changing conditions. In addition, ISO 16757-4 defines a mapping to the dictionary model of ISO 12006-3.

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Data structures for electronic product catalogues for building services —

Part 5:
Product catalogue exchange format

1 Scope

This document describes how product catalogue data for building services products is exchanged by means of ISO 16739-1 (Industry Foundation Classes, IFC) and EN 17549-2 from manufacturers to designers of building services systems.

This document specifies how the product catalogue structures and content are set up using the definitions stored in a data dictionary.

In scope of this document are:

— processes for the provision and exchange of product catalogues;

— rules for the geometrical representation of products;

— representation of products, product classes, ports, in/outlets, components and accessories by using IFC;

— representation of properties in IFC and the use of IFC constraints for the representation of product variants;

— representation of parametric geometry and the generation of IFC geometries for selected variants;

— calculation of article number.

The resulting product catalogue can be used by designers to select the desired products and integrate them into their model of the building services system.

The expected audience of this document are software providers for the built environment sector and professionals working in the sector who create product catalogues or use product catalogues by means of software tools.

Not in scope of this document is the representation of properties in data dictionaries. The use of data dictionaries is described in ISO 16757-4.

2 Normative references

The following document is 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 6707-1, *Buildings and civil engineering works — Vocabulary — Part 1: General terms*

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

ISO 16757-4, *Data structures for electronic product catalogues for building services - Part 4: Data dictionary structures for product catalogues*

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ISO 23386:2020, *Building information modelling and other digital processes used in construction — Methodology to describe, author and maintain properties in interconnected data dictionaries*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 16757-1, ISO 16757-4, ISO 6707-1 and the following 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
object
any part of the perceivable or conceivable world

Note 1 to entry: An object is something abstract or physical toward which thought, feeling, or action is directed.

[SOURCE: ISO 12006-2:2015, 3.1.1]

3.2
attribute
data element for the computer-sensible description of a property, a relation or a class

[SOURCE: ISO 22274:2013, 3.2, modified — EXAMPLE has been removed.]

3.3
constraint
logical expression that restricts the possible values for one or several properties

3.4
data dictionary
centralized repository of data about data or data elements such as meaning, relationships to other data, origin, usage, and format

[SOURCE: ISO 23386:2020, 3.9, modified — The words "information about data" have been replaced with "data about data or data elements"; note 1 to entry has been removed.]

3.5
function
modular unit of programming code to perform specific tasks with algorithms and formulae for the calculation of computable, dynamic properties

Note 1 to entry: The representation of functions and formulae follows a simple program script syntax.

3.6
technical system
interconnected products for the supply and disposal of materials and energy to buildings

4 Overview of supported processes

4.1 General

This document describes the definition and handling of product catalogues that use IFC as their basic exchange format. In the following these product catalogues are referred to as IFC catalogues. The main processes, supported by the ISO 16757 series, are the definition of product catalogues as IFC catalogues with content from the manufacturer's catalogue, selection of individual products and insertion into the BIM project model (see Figure 1).

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