



**International  
Standard**

**ISO 16757-4**

**Data structures for electronic  
product catalogues for building  
services —**

**Part 4:  
Data dictionary structures for  
product catalogues**

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

*Partie 4: Structures des dictionnaires de données pour les  
catalogues de produits*

**First edition  
2025-10**

**iTeh Standards**  
**(<https://standards.iteh.ai>)**  
**Document Preview**

ISO 16757-4:2025

<https://standards.iteh.ai/catalog/standards/iso/ffd0d81a-c14f-4aea-aa3b-39a1564d9d94/iso-16757-4-2025>



**COPYRIGHT PROTECTED DOCUMENT**

© ISO 2025

All rights reserved. Unless otherwise specified, or required in the context of its implementation, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office  
CP 401 • Ch. de Blandonnet 8  
CH-1214 Vernier, Geneva  
Phone: +41 22 749 01 11  
Email: [copyright@iso.org](mailto:copyright@iso.org)  
Website: [www.iso.org](http://www.iso.org)

Published in Switzerland

# Contents

Page

<b>Foreword</b>	<b>iv</b>
<b>Introduction</b>	<b>v</b>
<b>1 Scope</b>	<b>1</b>
<b>2 Normative references</b>	<b>1</b>
<b>3 Terms and definitions</b>	<b>2</b>
<b>4 Modelling of required kinds of data</b>	<b>3</b>
4.1 General	3
4.2 Overall model	3
4.3 Subject kinds of the overall model	4
4.3.1 Product	4
4.3.2 Catalogue	5
4.3.3 Block	6
4.3.4 Ports and in/outlets	7
4.4 Relationship types	9
4.4.1 isSubtypeOf	9
4.4.2 hasPart	10
4.4.3 hasBlock	11
4.4.4 isDependentOn	11
4.4.5 isSubkindOf	11
4.5 Property kinds and their representation in the overall model	12
4.5.1 General	12
4.5.2 What does a property describe	12
4.5.3 Representation of the property kinds using the overall model	13
4.6 Relationship to data templates	15
<b>5 Representation of the overall model by means of ISO 12006-3</b>	<b>15</b>
5.1 General	15
5.2 Relationships in ISO 12006-3	16
5.2.1 Overview	16
5.2.2 Property relationships	16
5.2.3 Subject relationships	16
5.3 Dictionary meta level to define subject kinds and relationship types	17
5.4 Kinds of subjects at the dictionary meta level	20
5.5 Subject relationship types at the dictionary meta level	20
5.6 Property relationships	22
<b>6 Specific rules and recommendations</b>	<b>22</b>
6.1 General	22
6.2 Rules for specific situations	22
6.2.1 Cardinality properties for hasPart and hasBlock relationships	22
6.2.2 References to literature	22
6.2.3 Positioning in space	23
6.2.4 Predefined calculation functions for dynamic properties	23
6.2.5 Relationships to classifications or other dictionaries	23
6.3 Recommendations for dealing with controlled value lists	24
6.3.1 Problem description	24
6.3.2 Property value list with subject contextual filtering	24
<b>Bibliography</b>	<b>25</b>

## 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 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](http://www.iso.org/directives)).

ISO draws attention to the possibility that the implementation of this document may involve the use of (a) patent(s). ISO takes no position concerning the evidence, validity or applicability of any claimed patent rights in respect thereof. As of the date of publication of this document, ISO had not received notice of (a) patent(s) which may be required to implement this document. However, implementers are cautioned that this may not represent the latest information, which may be obtained from the patent database available at [www.iso.org/patents](http://www.iso.org/patents). ISO shall not be held responsible for identifying any or all such patent rights.

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

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 [www.iso.org/iso/foreword.html](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).

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](http://www.iso.org/members.html).

## 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.

This document outlines the requirements for data dictionaries to support both semantic definitions and data modelling in product catalogues. ISO 12006-3 defines the underlying data model for related data dictionaries and serves as the foundation of this document.

Tools are used to define, simulate and operate building services systems (including e.g. HVAC systems and building automation systems). To build such a system basically means to interconnect different products in a way that the resulting system fits into the building and works in accordance with the functional requirements. The products are selected from product catalogues of manufacturers or distributors. Important aspects of these products are their connection points and information on their behaviour in different situations.

The goal of this document is to support the engineering tools by enabling them to identify the relevant information easily in different data dictionaries. In the area of building services, a few generic concepts are widely used:

- dynamic properties describing the behaviour of products in different situations and load cases that are dependent on external properties describing external conditions;
- a distinction of data dictionary entries representing products, meta data of catalogues, and specific features of products like subfunctions or ports.

This document defines common kinds of data dictionary elements that provide a way to identify the basic structures across data dictionaries.

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 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 condition systems such as ducts and transitions between different forms. It also contains a concept for representing products as 3D solid models, which are made from thin sheet metal.