PD ISO/TR 16310:2014



BSI Standards Publication

Symbol libraries for construction and facilities management

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National foreword

This Published Document is the UK implementation of ISO/TR 16310:2014.

The development of PD ISO/TR 16310 was supported by the UK technical committee, B/555, Construction design, modelling and data exchange, in parallel with the development of the BS 8541 series.

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

PD ISO/TR 16310 provides a consistent and rigorous approach to the symbology for construction library objects. It is a resource for those wishing to adopt the methodical approach to the management of such symbols.

The principles in this standard have been implemented by the UK construction industry with the development of the BS 8541 Library objects for architecture, engineering and construction series to standardize how construction library objects should be prepared and how their quality can be assessed. It provides specific examples of the exchange of construction library objects in industry standard formats. More information regarding the content, representation and presentation of this PD ISO/TR can be found below.

'Content'

- BS 8541-1 covers principles and identification. It implements to the 'content' level in ISO/TR 16310, with emphasis to the 'type' and 'instance' distinction – see clause 5.1. It also offers information for 'classification' – see clause 5.2.

'Representation'

BS 8541-3, BS 8541-4 and BS 8541-6 taken together implement the representation level as seen in clause 5.1.

- BS 8541-3 covers 3D shape and standard geometric measurements.
- BS 8541-4 gives an overview on expected properties for 'specification and selection'.
- BS 8541-6 (in preparation) defines the properties needed to convey product and facility level declarations such as energy, environmental impact and waste rating declarations.

'Presentation'

- BS 8541-2 covers objects and 2d symbols, and the grammar of putting symbols together, with examples.
- BS 8541-5 (in preparation), discusses how multiple product parts and other components provided for context can be transmitted. For example a window lintel (overhead beam) product may be transmitted with a generic window and notional wall, but specific fixings and ties.

These two parts implement the 'presentation' level see clause 5.1.1. Together they address the issues relating to composing symbols both for an object and for an assembly of objects.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

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Published by BSI Standards Limited 2014

ISBN 978 0 580 85448 4

ICS 01.100.30

Compliance with a British Standard cannot confer immunity from legal obligations.

This Published Document was published under the authority of the Standards Policy and Strategy Committee on 31 December 2014.

Amendments/corrigenda issued since publication

Date	Text affected

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PD ISO/TR 16310:2014

TECHNICAL REPORT

ISO/TR 16310

First edition
2014-12-15

Symbol libraries for construction and facilities management

Librairie de symboles pour la gestion de la construction et des aménagements

Reference number
ISO/TR 16310:2014(E)

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Published in Switzerland

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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).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

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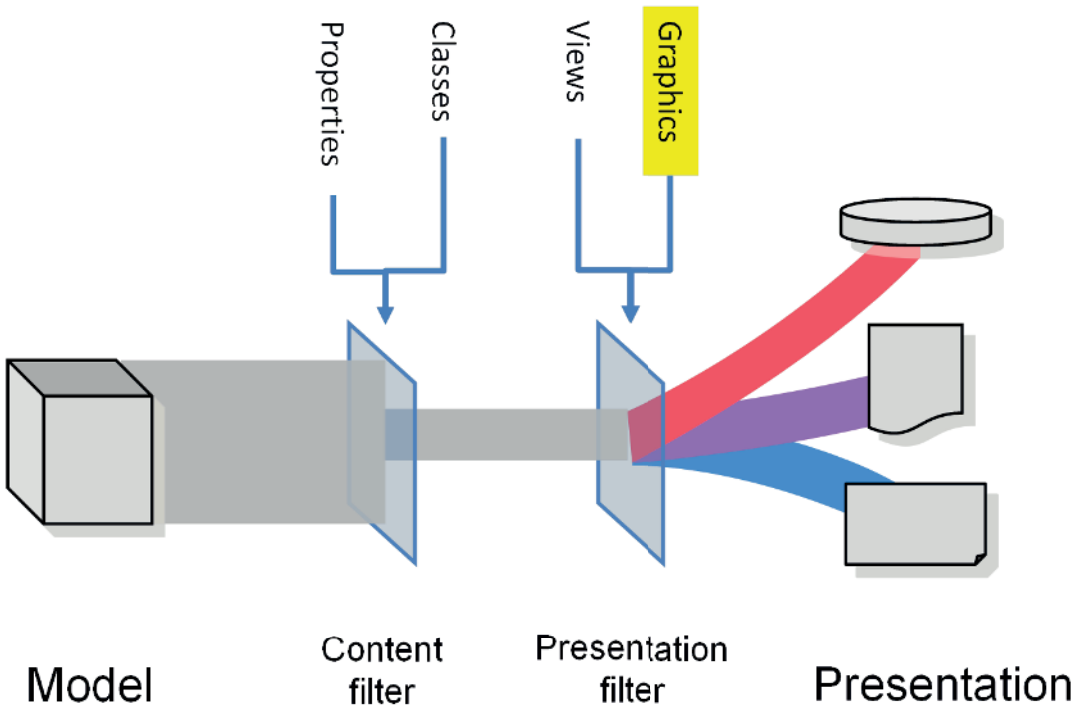
For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT), see the following URL: Foreword — Supplementary information.

The committee responsible for this document is ISO/TC 10, *Technical product documentation*, Subcommittee SC 8, *Construction documentation*.

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Introduction

Drawings, documents, and other presentations are increasingly being derived from models instead of being produced independently. The content, text, and graphics of the presentation are defined by applying rules, filters, to the model.



a) **Content** is selected from the model by using classification or other properties of the objects therein.

b) **Appearance,** using the presentation filter, is defined by selecting views, including formatting of content, and applying graphics. The graphics can be taken directly from the model but is often simplified and/or made more distinct by using **symbols** or simplified representation.

c) **Presentations** in the form of text, drawings, images, or other forms are the result, to be viewed on screen or printed.

Technical documentation relies heavily on graphics, whether it is presented on paper as drawings, or displayed on a computer screen. Also, much of the graphics is usually in the form of symbols or simplified representation. A symbol is a shape or a sign which represents something else, like the “flag” that symbolizes a light switch, while simplified representation resembles the object, and has physical dimensions equal to the object.

Standardized symbols play the role of a uniform (non-lexical) language that is understood in the same way by different readers. The potential benefits of using standardized symbols include savings in producing models and documentation, but above all, they serve to facilitate the efficient use of the documentation, and not least to avoid costly mistakes caused by misinterpretation.

This Technical Report investigates the needs and requirements within the construction and facilities management sector for symbol libraries, in digital form as well as the conventional printed form. Which libraries are needed? And how should they be defined, distributed, and maintained? The conclusions will be used to make decisions on future standardization.

Present standards for construction-related symbols have been created mainly to support uniform appearance on paper drawings produced by different authors.

The need for libraries of agreed symbols has not diminished over the years, but new issues related to the use of symbols have surfaced as practice has shifted from manual drafting to the use of computers

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for producing drawings and CAD/BIM models. Also, the roles of national and international standards have changed over the past few years. Overlapping parts of national and international standards have required the withdrawal of national standards without them being fully replaced by international standards. In particular, this applies to Europe, where published EN standards must not in any part be conflicting with national standards. Altogether, there is a need for a new approach to symbol standards.

This Technical Report is the outcome of a proposal for a joint effort of the committees ISO TC 10/SC 8, *Construction Documentation*, and ISO TC 59/SC 13, *Organization of information about construction work*.

In the final section of this Technical Report are recommendations for future standardization work, for sharing and discussion within the standardization community, in particular ISO TC 10/SC 8 and ISO TC 59/SC 13. Also, the work should be coordinated with standards and activities of buildingSmart International. The intended goal is to arrive at a common roadmap. Out of this, concrete standardization efforts can be initiated and carried out.

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TECHNICAL REPORT **ISO/TR 16310:2014(E)**

Symbol libraries for construction and facilities management

1 Scope

This Technical Report intends to specify the requirements and needs for supplying and managing standardized symbolic descriptions of objects that need to be specified in the construction process. Within this context, the term "symbol" is interpreted to cover pure symbolic presentation as well as simplified representation of geometrical shapes of objects.

2 Existing standards

The present situation is that standards are available only for some arbitrary categories of symbols, not covering the everyday needs of those producing and using documentation for buildings and civil works. The following table shows a brief review of ISO and EN standards as well as national standards for some countries. It is not a complete list but rather examples of the present situation.

Standard number	Title
ISO	
ISO 3766	Construction drawings — Simplified representation of concrete reinforcement
ISO 7518	Technical drawings — Construction drawings — Simplified representation of demolition and rebuilding
ISO 5261	Technical drawings — Simplified representation of bars and profile sections
ISO 5845 (all parts)	Technical drawings — Simplified representation of the assembly of parts with fasteners
ISO 6411	Technical drawings — Simplified representation of centre holes
ISO 6410 (all parts)	Technical drawings — Screw threads and threaded parts
ISO 4067-2	Building and civil engineering drawings — Installations — Part 2: Simplified representation of sanitary appliances
ISO 14617 (all parts)	Graphical symbols for diagrams
ISO 1219-1	Fluid power systems and components — Graphic symbols and circuit diagrams — Part 1: Graphical symbols for conventional use and data-processing applications
ISO 11091	Construction drawings — Landscape drawing practice
ISO 7519	Technical drawings — Construction drawings — General principles of presentation for general arrangement and assembly drawings
ISO 7437	Construction drawings — General rules for execution of production drawings for prefabricated structural components

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