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Structuring of technical information and documentation

Structuration des informations et de la documentation techniques

IEC 62023:2011

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**STRUCTURING OF TECHNICAL INFORMATION
AND DOCUMENTATION**

FOREWORD

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International Standard IEC 62023 has been prepared by technical committee 3: Information structures, documentation and graphical symbols.

It has the status of a horizontal standard in accordance with IEC Guide 108.

This second edition cancels and replaces the first edition of IEC 62023 published in 2000. This edition constitutes a technical revision.

This edition includes the following substantial changes with respect to the previous edition:

- the terminology used in the publication has been adapted to the one used in IEC 81346-1:2009 and IEC 62507-1:2010;
- the figures have been adapted to the principles used in IEC 81346-1:2009 in order to better illustrate the interrelations between the standards;
- the examples in the annexes have been provided with comments;

The text of this standard is based on the following documents:

FDIS	Report on voting
3/1050/FDIS	3/1071/RVD

Full information on the voting for the approval of this standard can be found in the report on voting indicated in the above table.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC web site under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
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The contents of the corrigendum of February 2012 have been included in this copy.

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INTRODUCTION

IEC 62023 can be seen as a bridge between system structuring principles and documentation structuring principles, in that it provides:

- a standardization of common practice in manufacturing industry with regard to the organization of information / documentation according to the product structure by means of a main document;
- a further detailing and formalization of guidance already given in IEC 61355-1:2008, by the general establishment of the main document concept with explicit referencing to complementary documents in a document set for a technical object; and
- an application of the object concept from the structuring principles of IEC 81346-1:2009 in the area of document structuring. It goes beyond the existing documents in that it shows how objects with several aspects can be kept together in a systematic way.

In Product Data Management (PDM) systems the "objects" in the product structure, which are configuration controlled information objects, correspond logically to main documents. However, although they fulfil all necessary requirements for being documents, the term is sometimes not used for them.

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STRUCTURING OF TECHNICAL INFORMATION AND DOCUMENTATION

1 Scope

This international standard provides rules for applying a method of structuring technical information and documentation by using a main document (leading document) for the clustering of the information for each object.

2 Normative references

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.

IEC 61082-1:2006, *Preparation of documents used in electrotechnology – Part 1: Rules*

IEC 61355-1:2008, *Classification and designation of documents for plants, systems and equipment – Part 1: Rules and classification tables*

IEC 61360, *Component data dictionary (CDD)*.

Available from: <<http://std.iec.ch/iec61360>>

IEC 62027: -, *Preparation of object lists, including parts lists*¹

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IEC/PAS 62569-1, *Generic specification of information on products – Part 1: Principles and methods*

IEC 81346-1:2009, *Industrial systems, installations and equipment and industrial products - Structuring principles and reference designations – Part 1: Basic rules*

IEC 82045-1:2001, *Document management – Part 1: Part 1: Principles and methods*

IEC 82045-2:2004, *Document management – Part 2: Metadata elements and information reference model*

ISO 7200, *Technical product documentation – Data fields in title blocks and document headers*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply. In the definitions, terms that are defined elsewhere in this clause are shown in *italics*.

An alphabetical index of terms is given in 3.4.

NOTE Definitions taken over from other international standards are not necessarily literally cited, but adapted to the form required for definitions according to the ISO/IEC Directives.

¹ In preparation.

3.1 General terms

3.1.1

object

entity treated in a process of development, implementation, usage and disposal

NOTE 1 The object may refer to a physical or non-physical “thing”, i.e. anything that might exist, exists or did exist.

NOTE 2 The object has information associated to it.

[IEC 81346-1:2009, definition 3.1]

3.1.2

system

set of interrelated *objects* considered in a defined context as a whole and separated from their environment

NOTE 1 The *system* is considered to be separated from the environment and from the other external *systems* by an imaginary surface, which cuts the links between them and the *system*.

NOTE 2 A *system* is generally defined with a view to achieve a given objective.

NOTE 3 The term *system* should be qualified if it is not clear from the context to what it refers.

Examples of a system: a drive system, a water supply system, a stereo system, a computer.

NOTE 4 When a *system* is part of another system, it may be considered as an *object*.

[IEC 351-21-20, modified]

3.1.3

plant

assembly of different *systems* on a specific site

[IEC 61355-1:2008, definition 3.10]

3.1.4

aspect

specified way of viewing an *object*

[IEC 81346-1:2009, definition 3.3]

3.1.5

structure

organization of relations among *objects* of a *system* describing constituency relations (consists of/is a part of)

[IEC 81346-1:2009, definition 3.9]

3.1.6

occurrence (of an object)

use of an *object type* within a specified context (another *object* or system) irrespective of which *object individual* is being used

[IEC 62507, definition 3.15]

3.1.7

identifier

attribute associated with an *object* to unambiguously identify it in a specified *domain*

NOTE In an identification system several types of identifiers may be required.

[IEC 62507-1, definition 3.8]

3.1.8 identification number ID

string of characters representing the value of the *identifier*

NOTE 1 It is practice that although the term says “number” the string can contain other types of characters as well.

NOTE 2 The terms product number, item number; part number; article number; product identifying number, traceability number (serial or batch) are sometimes used as synonyms to identification number.

NOTE 3 Identification numbers are often required to be *unique* (an object shall have one number only). This is an unnecessary strong requirement, it is sufficient if they are unambiguous. An object may have more than one identification number, even if this is an undesirable situation.

Furthermore, it is assumed in the definition that an organization may be responsible for more than one identification number domain. This is a commonly occurring situation when organizations are merged, etc.

NOTE 4 For products, identification number is normally assigned at the engineering of the object. Objects with the same identification number are supposed to have the same “form, fit and function” and hence being interchangeable.

[IEC 62507-1, definition 3.5, modified]

3.1.9 identification (activity)

act of associating *identification numbers* to an *object*

[IEC 62507-1, definition 3.4]

3.1.10 product number product ID part number part ID

identification number of a product, based on an identification system used by a particular organization

NOTE The term part is often synonym for a product that is expected to be used as a component of one or more assembled products. Part number is therefore synonym to product number.

3.1.11 reference designation

identifier of a specific *object* formed with respect to the *system* of which the *object* is a constituent, based on one or more *aspects* of that *system*

[IEC 81346-1:2009, definition 3.11]

3.1.12 reference designation set

collection of two or more *reference designations* assigned to an *object* of which at least one unambiguously identifies this *object*

[IEC 81346-1:2009, definition 3.14]

3.1.13 type (of object)

class of *objects* having the same set of characteristic properties

[IEC 62507-1, definition 3.16]

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3.2 Terms related to documentation structure

3.2.1

document

fixed and structured amount of information that can be managed and interchanged as a unit between users and *systems*

NOTE 1 This unit may not necessarily be human perceptible. Information is usually stored on a data medium.

NOTE 2 The term document is not restricted to its meaning in a legal sense.

NOTE 3 A document can be designated in accordance with the type of information and the form of presentation, for example overview diagram, connection table, function chart.

[IEC 61082-1:2006, definition 3.1.2 and IEC 82045-1:2001, definition 3.2.3, modified]

3.2.2

document number

document ID

identification number assigned to a *document*

[based on IEC 82045-2:2004, <documentId> (Clause 8)]

3.2.3

documentation (noun)

collection of *documents* related to a given subject

NOTE 1 This may include technical, commercial and/or other documents.

NOTE 2 The term subject may refer to objects in the sense of IEC 81346 or to other things to be addressed.

NOTE 3 A documentation can consist of documents, composite documents and document sets.

NOTE 4 The number and kinds of documents in a documentation can differ according to purpose.

[IEC 61355-1:2008, definition 3.5]

3.2.4

document set

collection of different *documents* which is intended to be treated as a unit

NOTE Document sets may consist of documents and composite documents.

[IEC 61355-1:2008, definition 3.4]

3.2.5

main document

leading document

document representing an *object* and containing or referring to the complete information on the *object*

3.2.6

single-level main document

main document that specifies one assembly level of sub-*objects* only

3.2.7

multi-level main document

main document that specifies more than one assembly level of sub-*objects*

3.2.8

complementary document

supplementary document

referenced *document*, containing part of the information on an *object*

NOTE Complementary documents may carry the detailed information, while the main document may carry information on the organization of the complementary documents only. Example: drawings can be complementary documents to object lists.

3.2.9

document kind

type of *document* defined with respect to its specified content of information and form of presentation

NOTE Sometimes the term document type is used for the same concept.

[IEC 61355-1:2008, definition 3.6]

3.2.10

document kind class

group of *document kinds* having similar characteristics concerning content of information independent from the form of presentation.

[IEC 61355-1:2008, definition 3.7]

3.3 Terms related to document structure

3.3.1

document part

identifiable part of a *document* having a defined purpose with respect to the *document*

NOTE The concept of document parts emanates from the observation that a document can be sub-divided into parts, logically and/or physically. A logical part presents information in a homogeneous form of presentation. Examples of such parts are: administrative part, part containing characteristic properties, part containing complementary documents, drawing part, revision part, and document header. Example of physical parts: page, text block, figure, or, considering other media than paper: diskette.

3.3.2

composite document

document containing different parts of information, each part related to a different *document kind class*

[IEC 61355-1:2008, definition 3.3]

3.3.3

list item

presentation as part of a table or list of an ordered set of *characteristic property* values pertaining to one specific *object*

[IEC 62027:--, definition 3.3.1]

3.3.4

document list body

table containing *list items* specifying *documents*

3.3.5

object list body

table containing *list items* specifying the *objects* that constitute an assembly (or sub-assembly) or *system* and, if necessary, reference documents

[IEC 62027:--, definition 3.3.2]

3.4 Alphabetical index of terms

Term	Term number
aspect	3.1.4
complementary document	3.2.8
composite document	3.3.2
document	3.2.1
document ID	3.2.2
document kind	3.2.9
document kind class	3.2.10
document list body	3.3.4
document number	3.2.2
document part	3.3.1
document set	3.2.4
documentation (noun)	3.2.3
ID	3.1.9
identification	3.1.9
identification number	3.1.8
identifier	3.1.7
leading document	3.2.5
list item	3.3.3

Term	Term number
main document	3.2.5
multi-level main document	3.2.7
object	3.1.1
object list body	3.3.5
occurrence	3.1.6
part ID	3.1.10
part number	3.1.10
plant	3.1.3
product ID	3.1.10
product number	3.1.10
reference designation	3.1.11
reference designation set	3.1.12
single-level main document	3.2.6
structure	3.1.5
supplementary document	3.3.2
system	3.1.2
type	3.1.14

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4 General

4.1 Basic principles of structuring of systems, installations and products

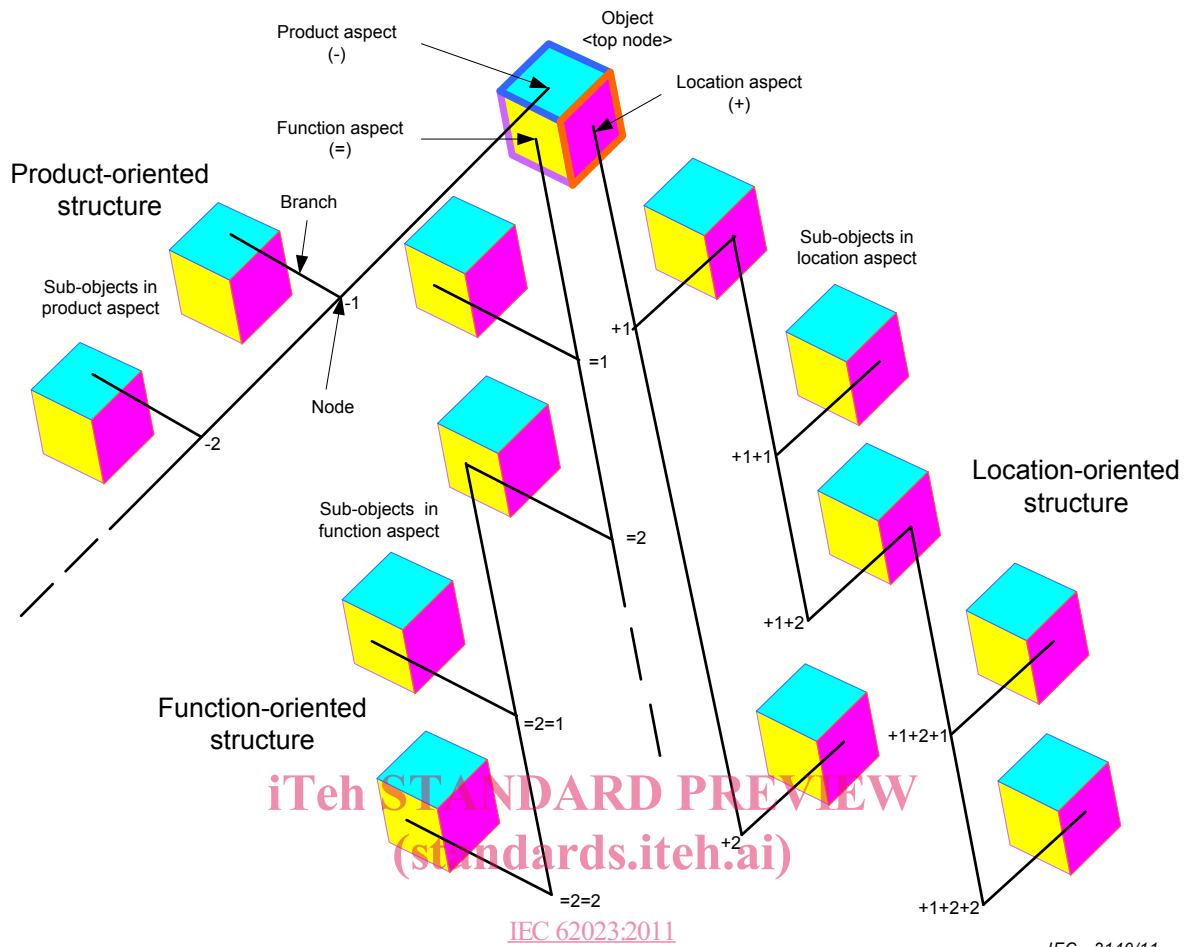
In order to design, manufacture, operate and maintain systems, installations or products efficiently, these are usually divided into parts or *objects*. The establishing of objects and the organization of the relations among them is called *structuring*, and the result a *structure*.

In accordance with IEC 81346-1:2009 different structures can be recognized depending on the *aspect*, for example:

- a function-oriented structure;
- a product-oriented structure;
- a location-oriented structure.

Other structures may be relevant for certain purposes.

Each structure is formed in a tree-like, hierarchical way as shown in Figure 1. In such structures a node represents an object that is of interest from the chosen aspect. It is divided into its constituents, lower-level objects, as indicated by the branches. These constituent parts can in turn be divided into their constituent branches etc.



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Figure 1 – Illustration of an object with three aspects, and where each of these aspects are used for sub-structuring

The different structures suit different working tasks:

- a function-oriented structure is based on the purpose of a system. A function-oriented structure shows the subdivision of the system into constituent objects with respect to the function aspect, without taking into account possible location and/or product aspects of these objects;

NOTE 1 Documents in which the information on a system is organized in accordance with a function-oriented structure highlight the functional relations among the components of that system.

- a product-oriented structure is based on the way a system is implemented, constructed or delivered using intermediate or final components. A product-oriented structure shows the subdivision of the system into constituent objects with respect to the product aspect without taking into account possible function and/or location aspects of these objects;

NOTE 2 Documents in which the information on a system is organized in accordance with a product-oriented structure highlight the physical arrangements of the components of that system.

- a location-oriented structure is based on the topographical layout or the spatial constituents of an object. A location-oriented structure shows the subdivision of the system into constituent objects with respect to the location aspect without taking into account possible product and/or function aspects of these objects.

NOTE 3 Documents in which the information on a system is organized in accordance with a location-oriented structure highlight the topographical relations among the components of that system.

For further information on structuring, see IEC 81346-1:2009.