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Structuring of technical information and documentation

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National foreword

This British Standard is the UK implementation of EN 62023:2012. It is identical to IEC 62023:2011, incorporating corrigendum February 2012. It supersedes BS EN 62023:2001 which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee GEL/3, Documentation and graphical symbols.

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

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 62023

January 2012

English version

Structuring of technical information and documentation
(IEC 62023:2011)

Structuration des informations et de la
documentation techniques
(CEI 62023:2011)

Strukturierung technischer Information
und Dokumentation
(IEC 62023:2011)

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Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CENELEC member.

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CENELEC

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

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Foreword

The text of document 3/1050/FDIS, future edition 2 of IEC 62023, prepared by IEC/TC 3 "Information structures, documentation and graphical symbols" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 62023:2012.

The following dates are fixed:

- latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement   (dop)   2012-08-23
- latest date by which the national standards conflicting with the document have to be withdrawn   (dow)   2014-11-23

This document supersedes EN 62023:2000.

EN 62023:2011 includes the following significant technical changes with respect to EN 62023:2000:

— the terminology used in the publication has been adapted to the one used in EN 81346-1:2009 and EN 62507-1:2011;

— the figures have been adapted to the principles used in EN 81346-1:2009 in order to better illustrate the interrelations between the standards;

— the examples in the annexes have been provided with comments;

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC [and/or CEN] shall not be held responsible for identifying any or all such patent rights.

Endorsement notice

The text of the International Standard IEC 62023:2011 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following notes have to be added for the standards indicated:

IEC 62507-1:2010   NOTE   Harmonized as EN 62507-1:2011 (not modified).

IEC 81346-2:2009   NOTE   Harmonized as EN 81346-2:2009 (not modified).

Annex ZA
(normative)

Normative references to international publications with their corresponding European publications

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.

NOTE   When an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

Publication	Year	Title	EN/HD	Year
IEC 61082-1	2006	Preparation of documents used in electrotechnology - Part 1: Rules	EN 61082-1	2006
IEC 61355-1	2008	Classification and designation of documents for plants, systems and equipment - Part 1: Rules and classification tables	EN 61355-1	2008
IEC 61360	-	Component data dictionary (CDD)	-	-
IEC 62027	-	Preparation of object lists, including parts lists	EN 62027	-
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	EN 81346-1	2009
IEC 82045-1	2001	Document management - Part 1: Principles and methods	EN 82045-1	2001
IEC 82045-2	2004	Document management - Part 2: Metadata elements and information reference model	EN 82045-2	2005
ISO 7200	-	Technical product documentation - Data fields in title blocks and document headers	EN ISO 7200	-

CONTENTS

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.

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]

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]

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

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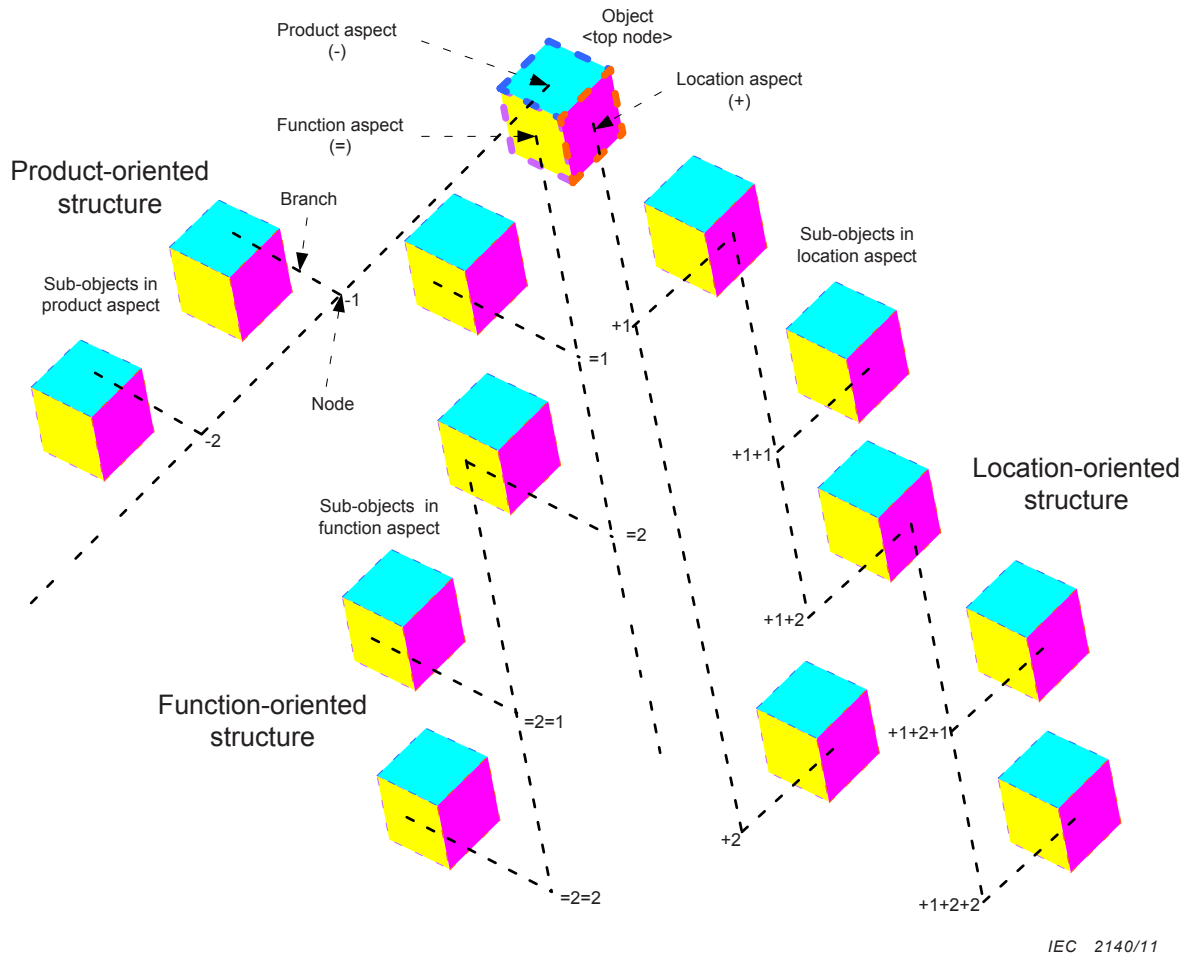
**Figure 1 – Illustration of an object with three aspects,
and where each of these aspects are used for sub-structuring**

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.

4.2   Objects and documents describing the objects

A number of different ways of producing, presenting, storing and distributing information about objects exist.

Computers make it easy to process a set of information as a coherent unit, in principle regardless of volume. Outside of the computer system, this set of information has usually to be divided into subsets of information for transfer to other systems and for presentation via other media.

Traditional practice is to work with limited subsets of information in the form of *documents*, a concept that is also used in connection with computer-stored information and has therefore acquired the generalized definition of a structured set of information capable of being processed and exchanged as a unit between users and/or systems.

4.3   Documentation structure and document structure

4.3.1   Documentation structure

The *documentation structure* describes how the total amount of information about a plant, system, product, etc. is split up among different documents and the relations among these documents.

A documentation structure that takes advantage of the object concept very precisely reflects the structure of the actual plant, system, equipment or product. The defined documents shall then be associated to the object as a whole or to the identified sub-objects. A defined document should not deal with anything outside of the relevant object or sub-object.

NOTE   This does not prohibit that a document in such a set of documentation also can be used (by reference) to give information on another object, provided that it as a whole is relevant also in that context.

Sets of documentation thus defined can then be manipulated as a whole in order to fit into different contexts, which is a necessary prerequisite for efficient re-use of information.

4.3.2   Document structure

The *document structure* describes how the information *within* a specific document is split up in different *document parts* and the relations among these parts.

A document part is a sub-information-object which has an existence of its own and is characterized in that it:

– has a coherent form of presentation (e.g. text, drawing, etc so that it can be manipulated with one tool); or

– deals with a specific subject (e.g. chapters and clauses in a text, see also Figure 2); or

– presents a specific sub-object (e.g. instance diagrams in a circuit diagram); or

– forms a physical (layout) block (e.g. a page or an illustration that must be kept together on one page);

– etc.

A document part is identifiable and it is possible to manage this part like a document as a whole.

A document part can consist of other document parts. The document parts are thus possible to be organized in a consist-of/is-part-of document structure. Such a structure is always inherent in a composite document.
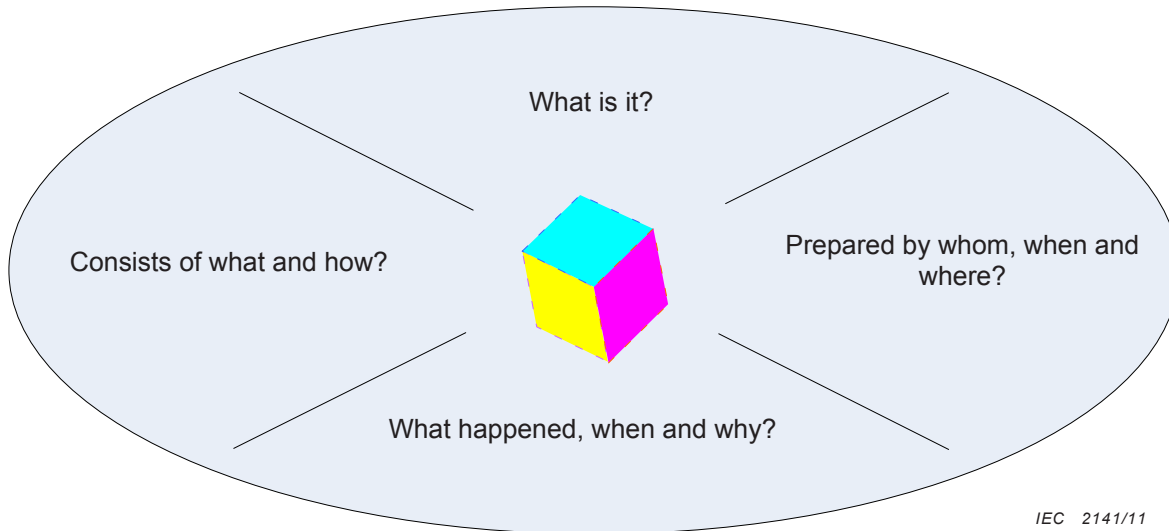
Figure 2 – Information content of a document describing an object

4.3.3 Border between documentation structure and document structure

The border between documentation structure and document structure is arbitrary and based on a decision on which sets of information are required to be presented as one document for reasons of e.g. tradition, target group, reusability and available tools.

NOTE   In the context of the tools used for the preparation of documents, the document parts are often managed in a way similar to that for the management of documents.

As an example the documentation for an object can be implemented either as a set of documents, each with a coherent form of presentation, or as one single composite document in which each of these forms of presentation is dealt with as a document part (see Figure 4).

5   Main document and complementary documents

5.1   General

The information to be provided for an object shall be clearly related to this object.

This information is, when presented, normally split on several documents. To ensure that the information can nevertheless be kept together, one of the documents is depicted *main document* (alternative term "leading document"), the others being *complementary documents* (see Figure 3).

IEC   2142/11
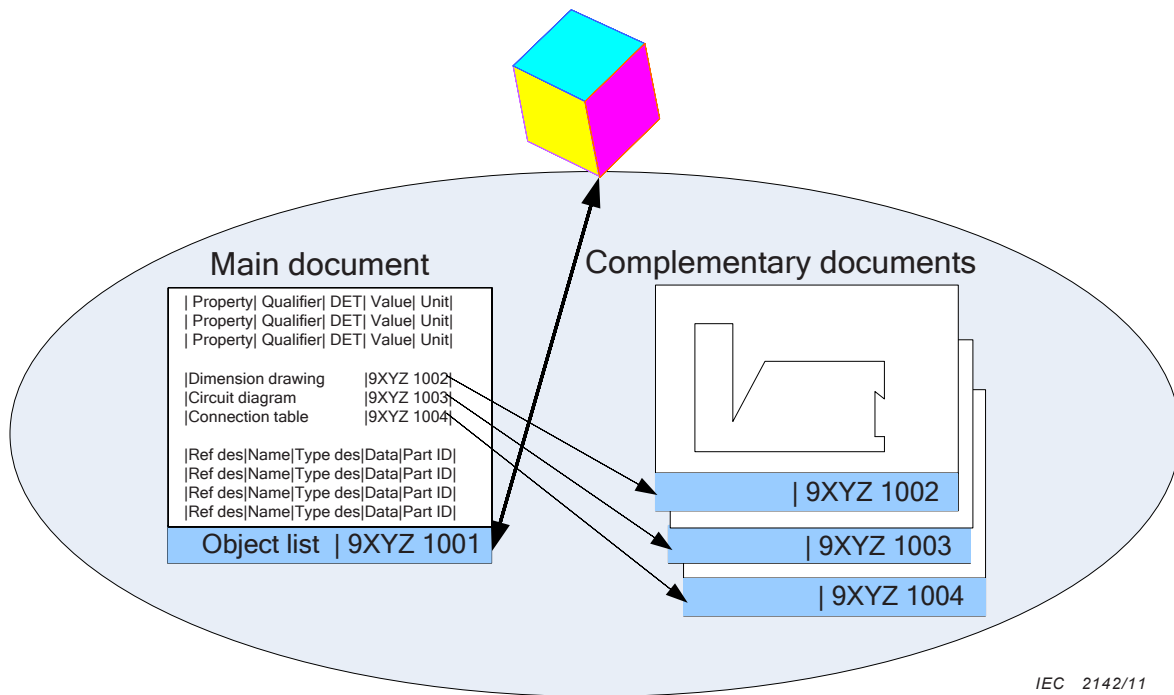
Figure 3 – Documentation structure for a single object

The main document then represents the complete technical object and is characterized by the following features:

- it shall have a close relation to the technical object described (for example: part number and document number are the same or closely related, or: document designation that includes object designation (e.g. reference designation including top node identification)); and

- it should refer to all complementary documents, either directly or indirectly via a separate document list.

Complementary documents should not refer back to the main document.

NOTE 1   If complementary documents are used together with different main documents, references back creates an immense demand for updating of the complementary documents.

It is thus always possible to refer to the complete set of information by means of the part number (in the context of the issuing organization), or by the top node identifier, or by the reference designation that identifies the object (in the context of the system, product, etc.). It is also possible to refer to and to use the same complementary documents for a number of similar objects.

NOTE 2   As the references to the complementary documents are made explicitly, there is no need for any systematic in document numbering, etc.

NOTE 3   In Product Data Management (PDM) systems the "objects" (in the product-oriented structure) which are configuration controlled information objects, correspond logically to main documents. However, although they fulfil all necessary requirements for being documents, they are sometimes not considered as documents.

5.2   Contents of the main document

5.2.1   Document parts

The main document shall contain an administrative part and a part listing the complementary documents ("document list body"), or refer to such a list. It may in addition contain:

- a part containing characteristic properties of the object ("property list body");

- a part listing the constituents of the object ("object list body").

Annex A shows an example of a main document containing these parts.

For the administrative part, see IEC 82045-1:2001 and IEC 82045-2:2004 dealing with document management.

5.2.2   Document part containing complementary documents

This part shall contain a list of the complementary documents.

The part should be prepared in the form of a "document list body", in which the document list items specify documents by means of essential metadata for the documents in order to make them unambiguously identified and traceable.

The following metadata is mandatory:

    document ID <DocumentId>

The following metadata are optional:

- language code <LanguageCode>
- revision index <DocumentRevisionId>
- document kind code <DocumentClassIdIEC61355>
- document kind <DocumentClassName>
- title <Title>

These metadata are further specified in IEC 82045-2:2004, from which the metadata identifiers shown within angle brackets (< >) have been taken.

5.2.3   Document part containing characteristic properties

This part shall contain a specification or description of the object by means of its characteristic properties.

The part should be prepared in the form of a "property list body" in which the properties are specified by means of essential metadata for the properties in order to make them unambiguously identified and traceable. Use should preferably be made of relevant data element type definitions in international standards such as IEC 61360 and ISO 13584.

The values of the properties are normally associated with a specific life cycle phase of the object, for example "as supplied", i.e. the property values as manufactured and supplied to the customer.

If values associated with several life cycle phases are supplied, the properties shall be individually qualified. For further information, see IEC/PAS 62569-1. See also example in Annex A.

5.2.4   Document part containing constituent objects

This document part shall contain a list of the sub-objects in accordance with the chosen aspect.

The part should be prepared in the form of an "object list body", in which the list items specify sub-objects by means of essential metadata for the sub-objects in order to make them unambiguously identified and traceable. For further information, see IEC 62027.

The method to include this document part in the main document makes it possible to trace the sub-ordinate objects more easily than in any of the other methods, and therefore recommended.

A main document can be used to specify an object from many aspects by inclusion of one object list body for each relevant aspect. How this can be done is illustrated in the Annex A.

5.3 Relationship between main document and complementary documents

5.3.1 Main document

As a consequence of 5.2, main documents are commonly based on the following document kinds:

- **single document, e.g. component drawing**; in which the property list body is predominant. This document kind is especially used for purchased components, specified by means of a list of requested characteristic properties, sometimes supplemented by a textual description or an illustration;
- **object list**; see Figure 4b), in which the object list body is predominant. For more information on object lists, including parts lists, see IEC 62027:--; or
- **list of documents**; see Figure 4c), in which the document list body is predominant. The scope of such a list is limited to the actual object.

NOTE Documents of the above kinds are not always main documents. The requirements with regard to identification and referencing to the complementary documents have to be fulfilled as well.

A main document may also take the form of a single composite document containing the whole set of information about the technical object concerned (see Figure 4a).

The opposite to that is the List of documents, with its scope limited to the actual object, and listing all the documents that contain actual information, including the parts list document (see Figure 4c).

5.3.2 Complementary documents

The complementary documents for an object are usually many and of different document kinds. The type of object determines which document kinds need to be used.
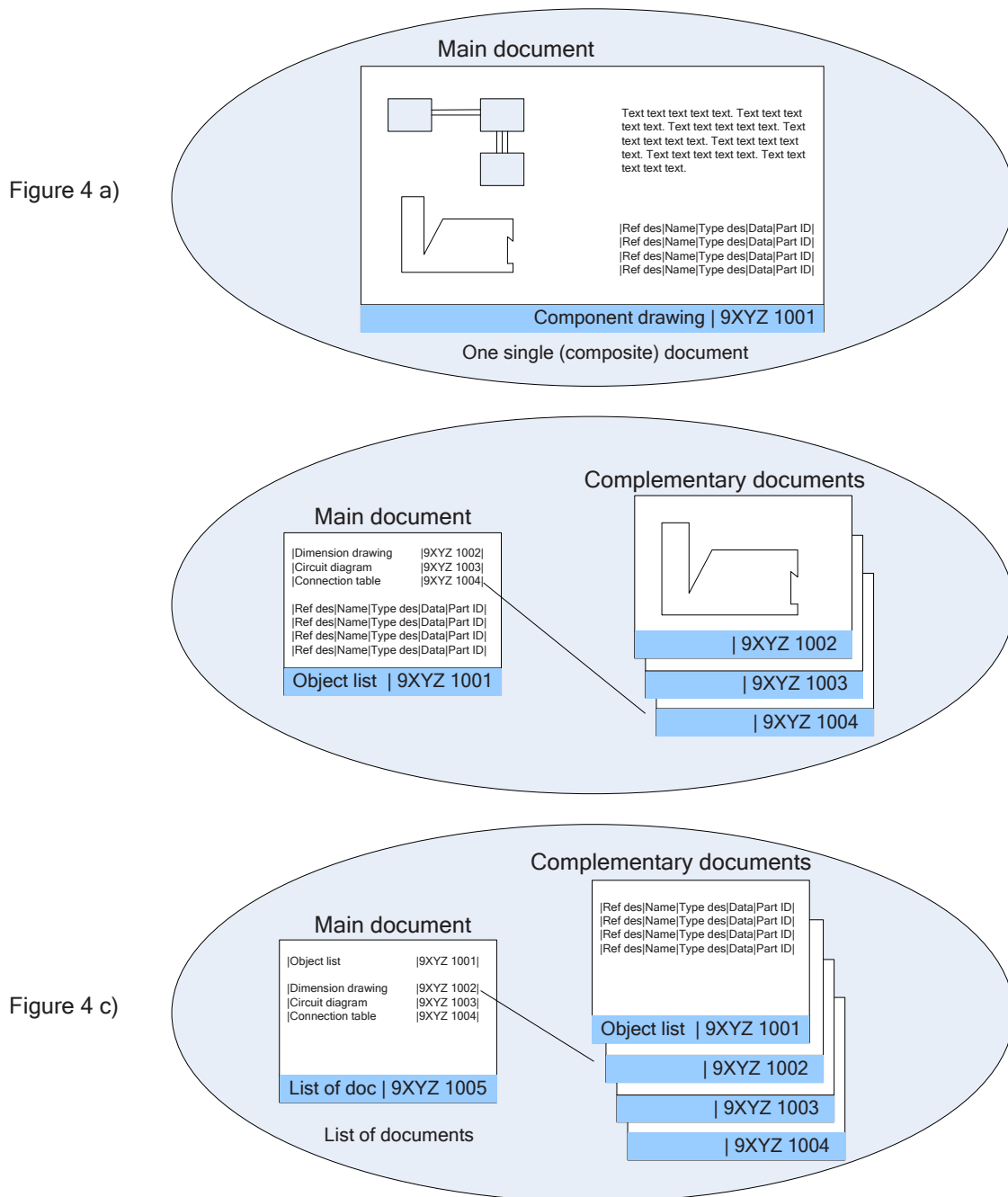
Figure 4 a)

Figure 4 c)

IEC   2143/11

Figure 4a)   The complete information is available in one single (composite) document, which therefore is the main document.

Figure 4b)   The complete information is available in a set of documents. The main document is an Object list / Parts list that specifies constituents and all complementary documents

Figure 4c)   The complete information is available in a set of documents. The main document is a List of documents that specifies all complementary documents, including an Object list / Parts list.

Figure 4 – Main document and complementary documents; illustration of different degrees of partitioning of the information into different documents

5.4   Single-level and multi-level main documents

In the design and engineering process the defined structures normally contain objects on many structural levels.

In many cases, especially in engineering for manufacturing of products, the documentation is prepared object-by-object, with *single-level main documents*, i.e. main documents that specify the next sub-ordinate structure level only.

In other cases, especially in plant engineering, documentation may cover many objects, with a *multi-level main document*, i.e. a main document that specifies sub-objects relating to more than one sub-ordinate structural level. This may be the case if there is no need to identify (by means of a part number or document number) a sub-ordinate object outside of the context of the main document (i.e. to identify it as a generally usable type).

5.5   Classification of the main document

If the document kind classification system according to IEC 61355-1:2008 is applied then the main documents should be classified as belonging to class AB (i.e. Lists (regarding documents), according to Table A.2 - DCC and description of document kind classes), irrespective of what document kind it is based on, since its role of being a main document is dominating with respect to document administration.

NOTE In a document set for an object the main document should preferably precede all complementary documents. If the document classification system according to IEC 61355-1:2008 is applied, the documents are normally alphabetically sorted with regard to the document classification code. Code AB will therefore bring the main document to the top and place it directly after a possible cover sheet.

6   Representations of an object

6.1   General

Two measures make it possible to apply the same documentation principles for plants, systems and products, whatever their extent:

- systematic structuring in accordance with IEC 81346-1:2009, with the aim to define and identify objects; and
- for each such object clustering of the information by means of a main document, as described in Clause 5.

A documented object type may thus be referenced as a whole by a reference to the main document.

Figure 5 illustrates the principle of the resulting documentation structure with objects arranged in a tree-like structure, and the documents pertaining to each object. Each of the objects in this example is composed as in Figure 3. The arrows pointing to the "common document resource" to the left illustrate the multiple use of complementary documents.

In order to facilitate reuse of documentation associated with an object *type*, the following items should be considered carefully in the preparation of documents:

- Presentation of an object type at its occurrences, see 6.2;
- Referencing from the object occurrences to the documentation associated with the object type, see 6.3;
- Metadata to be presented in the identification area of documents, see 6.4.

6.2   Presentation of an object type at its occurrences

In hierarchically structured documentation a sub-object shall be represented in the documentation of the object on the next higher structural level, where the occurrence of the sub-object is put in a context together with other sub-objects presented on that level. If the higher level object is documented by several document kinds, the sub-object will usually need to be represented in more than one of these documents.

The required representation of the occurrence of the sub-object depends of the form of presentation used in each of these document kinds. The general requirement on such a representation is that it shall be as simplified as possible, but still provide enough detail for documentation of all relevant interfaces to other sub-objects.

The following examples illustrate this principle:

- in object lists; the list item should contain:
  - occurrence (reference designation);
  - type (type designation or part number); and where necessary also
  - properties (the most relevant properties in the actual context).
- in diagrams: representation of the object by an instance diagram or by a symbol, presenting:
  - occurrence (reference designation);
  - the type designation or main document of the object; and
  - its reference designation; and
  - the terminals and electrical or other connections to it.
- in drawings: representation of the object type by an instance drawing (simplified pictorial drawing, dimension drawing), presenting:
  - occurrence (reference designation);
  - the type designation or main document of the object; and
  - its reference designation; and
  - the physical dimensions and the physical interface to other parts.

For further information on how to prepare list items for object lists, including parts lists, see IEC 62027.

For further information on the use of instance diagrams and symbols in diagrams, see IEC 61082-1:-, Clause 11.

For further information on the use of instance drawings, see ISO/DIS 29845 (e.g. interface drawing, outline drawing)

6.3   Referencing

When object occurrences are shown in a document, it is necessary to provide mechanisms in order to easily get to the detailed description of the corresponding object type. If the documentation is following the principles laid down in this standard, the reference from the object occurrence representation to the object type documentation may be performed by means of the main document associated with the object occurrence.

NOTE   This mechanism can be supplemented with a direct reference from the object occurrence to the relevant object type document. Object type documents should not refer to occurrences.

6.4   Document metadata

Documents shall be associated with metadata in accordance with IEC 82045-1:2001 and IEC 82045-2:2004. Some of these data are presented in the identification area of the document (i.e. the title block, see ISO 7200).

Metadata of documents associated with an object type shall only be related to that object type. No references shall be made to objects external to the object type or to occurrences of the object type.

NOTE   It is important to notice that any reference designations occurring in the documents refer to the described object as the top node of its tree-like structures.
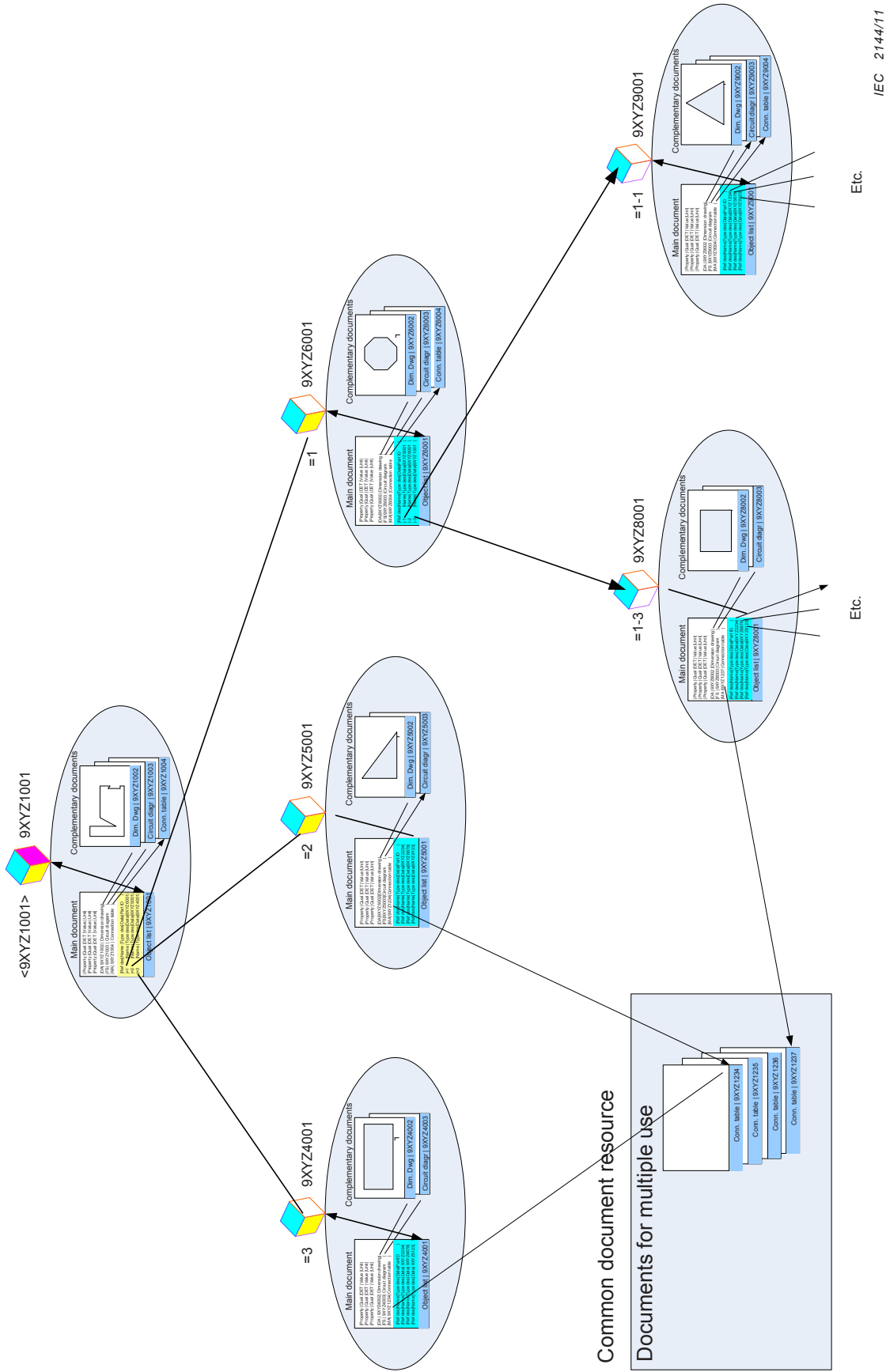
Figure 5 – Relations among objects and documents

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Annex A
(informative)

Example of a composite main document based on a parts list document

This example illustrates how a main document can be prepared based on a parts list document, in which document parts for characteristic data (see A.1) and complementary documents (see A.2) have been added, in addition to the document part for constituent objects (see A.3). **The reference designations used in the example (–G1 in A.3; Reference designation set) are referred to an external "top node" object.** The example presupposes that the object is internally subdivided from one aspect only; in this case the product aspect. If subdivisions from other aspects exist, document parts like the one for A.3 shall be added for each of them. This main document is referenced in Annex B, B.4.

A.1 Characteristic properties

Characteristic property	Quantity	Qualifier	Data Element Type	Value	Unit	Comment
Flow	Q	As built	To be defined	60,0	l/s	(DET is not yet in the IEC 61360DB)
Pressure head	H	As built	To be defined	15	m	(DET is not yet in the IEC 61360DB)
Mass	m	As delivered	AAE752	270	kg	
Type designation	-	As specified	AAH547	PXWH100	-	
Instance presentation	-	As built	To be defined	60 l/s; 15 m; 293 K; 18,5 kW	-	(DET is not yet in the IEC 61360DB)
Etc.						This is to be used for presentation in higher-level object lists. Cf. IEC 62027 Annex A.

A.2 Complementary documents

Document designation	Document number	Revision index	Language code	Document kind	Title
DA	9678 45679	-	en	Dimension drawing	
DC	6CVB 98452	D1	en	Installation instruction	
DC	6CVB 98674	-	en	Operating instruction	
FS	9AXA 99880	D2	en	Circuit diagram	
MA	9AXA 99881	A	en	Connection table	

Prepared date / by	Approved date / by	Plant / Project	Object	Revision index	Page
2009-12-01 AB	2009-12-10 CD	Plant Company Ltd	Pump assembly	2	1/5

				Plant owner document number	Revision index	Page
				ABCD34567		1/5
				Document designation		
				-G1&AB		

Released date / by	Status	Supplier	Document kind	Object	Supplier document number	Language	Revision index
2009-12-15	As built	**Pump Company Ltd**	PARTS LIST	Pump assembly	6CVX12345	en	5

Etc.

A.3 Constituent objects (in accordance with the product aspect and IEC 62027 Class B)

Reference designation set	Part name; Usage	Type designation	Technical data	Mass/unit kg	Identifier Domain ID	Identifier Part number	Document ref.
-G1							
-G1	Pump	AZG250	60 l/s; 15 m; 293 K	95		685T489-56	
-M1	Induction motor	HXR 180M4	18,5 kW; 400 V; 50 Hz; 1450 1/min; 35,4 A; IP55	100	MCOMP	R31SMAOL1	
-U1	Base plate			40		6CVX3748	
-U2	Mounting plate			5		6CVX7865	
-W1	Cable (prefab)			1		6CVX 9876-1	
-X1	Coupling			9	COPLEX	8KM6543-A	
Etc.							

Annex B
(informative)
Example of a main document based on a list of documents, referencing data sheet, object lists, etc

This example illustrates how a main document for an object can be prepared based on a list of documents (see B.1 List of documents), referencing separate documents for characteristic properties (see B.2 Data sheet) and listing of constituent objects (see B.3 Function list, B.4 Parts list and B.5 Location list). **The object is a "top node" identified by the document number of this document** (<7ABC12345>, cf. IEC 81346-1). All reference designations used in the example are therefore referred to this top node. The example presupposes that the object can be sub-divided from three aspects; in this case the function aspect (Function list; PF), product aspect (Parts list, PB) and location aspect (Location list; PL). If only one or two aspects are used the listings of the object lists for the missing aspects are simply omitted.

B.1   List of documents

Document designation <7ABC12345>	Supplier document number	Revision index	Language code	Document kind	Title	Plant owner document number
&DA	7ABC34567	C1	en	Data sheet	Processing line	ABCD34550
&DC	7ABC34571	B2	en	Installation instruction	Processing line	ABCD34551
&DC	7ABC34572	B5	en	Operating instruction	Processing line	ABCD34552
&EC	7ABC34573	A1	en	Requirement specification	Processing line	ABCD34553
&FS	7ABC34574	C1	en	Circuit diagram	Processing line	ABCD34555
&MA	7ABC34575	B1	en	Connection list	Processing line	ABCD34556
&MB	7ABC34576	A1	en	Cable list	Processing line	ABCD34557
&PB	7ABC56789	C1	en	Parts list	Processing line	ABCD34558
&PF	7ABC56790	C1	en	Function list	Processing line	ABCD34559
&PL	7ABC56791	C1	en	Location list	Processing line	ABCD34560
&TL	7ABC56792	A2	en	Layout drawing	Processing line	ABCD34554

Prepared date / by 2009-12-01 AB	Approved date / by 2009-12-10 CD	Plant / Project Plant Company Ltd Contract 42	Object Processing line	Plant owner document number ABCD34540 Document designation <7ABC12345>&AB	Revision index 2	Page 1/3
					Revision index	Page 1/3
Released date / by 2009-12-15	Status As built	Supplier Systems Company Ltd	Document kind LIST OF DOCUMENTS	Supplier document number 7ABC12345 Language en	Revision index 5	Page 1/3

B.2 Data sheet

Characteristic property	Quantity	Qualifier	Data Element Type	Value	Unit	Comment
Production capacity		As built	To be defined	500000	m³/year	(This DET is not yet in the IEC 61360DB)
Water consumption		As required	To be defined	750000	m³/year	(This DET is not yet in the IEC 61360DB)
Peak consumption		As built	To be defined	95	l/s	(This DET is not yet in the IEC 61360DB)
Etc.						
Instance presentation	-	As built	To be defined	500000 m³/year; 95 l/s; etc..		(DET is not yet in the IEC 61360DB)

Prepared date / by	Approved date / by	Object		Plant owner document number	Revision index	Page
2009-12-01 AB	2009-12-10 CD	Processing line		ABCD34550	2	11/1
		Plant / Project		Document designation	Revision index	Page
		Plant Company Ltd Contract 42		<7ABC12345>&DA		1/1
Released date / by	Status	Supplier	Document kind	Supplier document number	Language	Revision index	Page
2009-12-15	As built	Systems Company Ltd	DATA SHEET	7ABC34567	en	5	11/1

B.3   Function list

Reference designation set <7ABC12345> =	-	+	Part name; Usage	Type designation	Technical data	Mass/unit kg	Domain ID	Part number	Document ref.
=G1			Feeding-in					-	
Etc.									
=V1			Dissolving					-	
=V1=G1			Pumping					-	
=V1=G1=BF1		+C04+2	Flow meter	AFA2	100 l/s	8	BCIE	9876543-1	BCIE 3456-B
=V1=G1=BP1		+C04+2	Pressure meter	APA12	20 kPA	2	BCIE	7654989-5	BCIE 9876-D
=V1=G1=G1	-G1-G1	+C04	Pump	AZG250	60 l/s; 15 m; 293 K	95		685T489-56	7ABC56770
=V1=G1=K1	-K1-U1	+C08	Control unit	CON123			CONCO	98745687A	
=V1=G1=M1	-G1-M1	+C04	Motor	HXR 180M4	18,5 kW; 400 V; 50 Hz; 1450 1/min; 35,4 A; IP55	100	MCOMP	R31SMAOL1	
=V1=G1=Q1	-W1-U1	+C09	Motor starter		400 V; 50 A	2,5	POWCO	98745011	
=V1=G1=Q2		+C04+1	Safety switch		400 V; 50 A		POWCO	98744022-A	
=V1=G1=S1		+C04+2	Local control unit	LC...			CONCO	98745547A	7ABC89765
=V1=H1			Mixing						
Etc.									
=G2			Feeding-out						
Etc.									

Callout (left): In this example there are no separate main documents prepared for these structural levels. This main document therefore covers three levels in this aspect. Cf. clause 5.4.

Callout (right): Since this document has "As built" status implemented function-oriented objects have the implementation names, while the higher-level "grouping objects" without direct implementation keep their function names.

Prepared date / by 2009-12-01 AB	Approved date / by 2009-12-10 CD	Object Processing line	Plant owner document number ABCD34558	Revision index 2	Page 11/10
	Status As built		Document designation <7ABC12345>**&PF**	Revision index	Page 1/10
Released date / by 2009-12-15					
Plant / Project Plant Company Ltd Contract 42		Document kind FUNCTION LIST	Supplier document number 7ABC56790	Language en	Revision index 5	Page 11/10
Supplier **Systems Company Ltd**					

B.4 Parts list

Reference designation set <7ABC12345>			Part name; Usage	Type designation	Technical data	Mass/unit kg	Part identifier		Document ref.
-	=	+					Domain ID	Part number	
-G1	**=G1**	**+C04+1**	Pump assembly	PXWH100	60 l/s; 15 m; 293 K; 18,5 kW	270	**PUMPCO**	**6CVX12345**	
-K1		+C08	Control assembly				CONCO	90876A67	
-W1		+C09	Switchgear assembly				POWCO	98745000	
Etc.									

Callouts:
- See Annex A
- The assemblies are further specified in the main documents for these components.
- Only assemblies referenced in this example are listed.

Prepared date / by	Approved date / by		Plant / Project	Object	Plant owner document number	Revision index	Page
2009-12-01 AB	2009-12-10 CD		Plant Company Ltd Contract 42	Processing line	ABCD34559	2	11/11
					Document designation <7ABC12345>&PB	Revision index	Page 1/11
Released date / by 2009-12-15	Status As built		Supplier Systems Company Ltd	Document kind PARTS LIST	Supplier document number 7ABC56789	Revision index 5 / Language en	Page 11/11

B.5 Location list

Reference designation set			Part name; Usage	Type designation	Technical data	Identifier		Document ref.
+	-	=				Domain ID	Part number	
+C04			Space for process equipment		Coordinate AG01-AM13			7ABC56792
+C04+1			(Space for) Pump assembly					7ABC56792
+C04+2			(Space for) Local control					7ABC56792
Etc.								
+C08			Room for control equipment					
+C08+1			(Space for) Control unit					
Etc.								
+C09			Room for electrical equipment					
+C09+1			(Space for) Fuse assembly					
Etc.								

Only spaces referenced in this example are listed.

Prepared date / by 2009-12-01 AB	Approved date / by 2009-12-10 CD	Object Processing line	Plant owner document number ABCD34560	Revision index
			Document designation <7ABC12345>&PL	Revision index
		Plant / Project Plant Company Ltd Contract 42		Page 1/4
Released date / by 2009-12-15	Status As built	Supplier Systems Company Ltd	Document kind LOCATION LIST	Supplier document number 7ABC56791

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Language en — Revision index C1 — Page 1/4

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