IEC 62027

Edition 2.0 2011-10

INTERNATIONAL STANDARD

NORME INTERNATIONALE

colour inside

HORIZONTAL STANDARD
NORME HORIZONTALE

Preparation of object lists, including parts lists

Établissement des listes d'objets, y compris les nomenclatures de composants

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Preparation of object lists, including parts lists

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

COMMISSION ELECTROTECHNIQUE INTERNATIONALE

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PREPARATION OF OBJECT LISTS, INCLUDING PARTS LISTS

FOREWORD

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International Standard IEC 62027 has been prepared by IEC 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 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 81346-1:2009:2009, IEC 62507-1:2010:2010 and IEC/PAS 62569-1:2009;
- the term "object list" has been introduced as the generic term, and "parts list" used as a specific term for object lists associated with the product structure;
- Annex A of the previous edition has been taken away and partly replaced by 6.2 and a reference to IEC 61355 DB;
- a new Annex A providing guidance on the presentation of subsets of characteristic properties has been introduced;

- a new Annex B providing source definitions and references to used data element types has been introduced;
- the examples in the annexes C, D and E (corresponding to B, C and D in the previous edition) have been provided with comments;

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

FDIS	Report on voting
3/1049/FDIS	3/1070/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
- amended.

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INTRODUCTION

An object list is primarily used to list and specify the constituent objects (components) of the overall object or system to which the object list applies.

It is generally recognized that information on products, installations and systems can be organized on the basis of tree-like, hierarchical, structures. The structure represents the way in which an industrial system or a product is divided into sub-systems or components, designated by the general term “constituent objects”. In the context of this International Standard, ”object” refers to any entity treated in a process of development, implementation, usage and disposal of a plant, installation, system, equipment, etc., or part thereof, in accordance with the definition in 3.1.1.

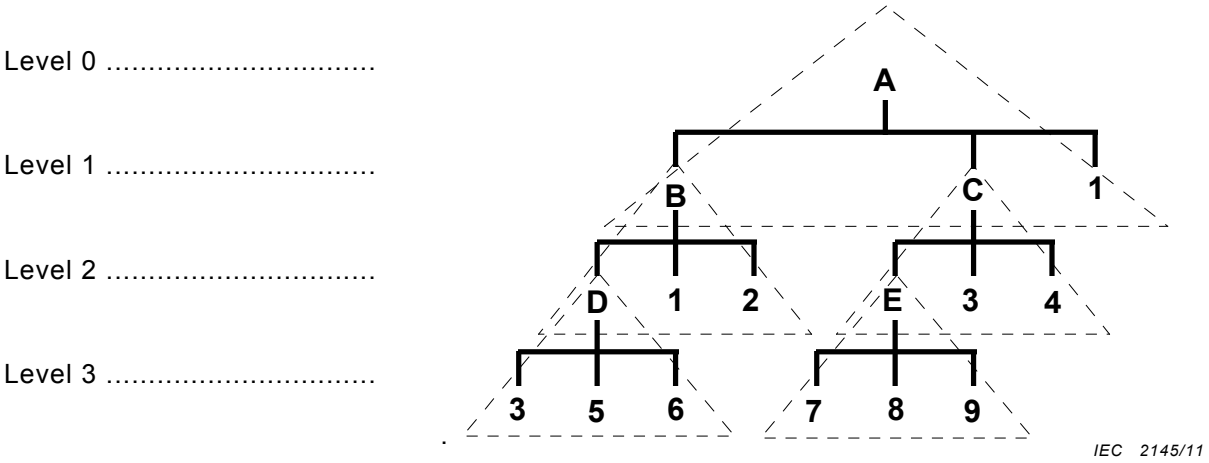
NOTE In the context of other standards, the term “item” is sometimes used with the same meaning as “object”.

Depending on the “aspect” different structures can be recognized, for example a “product-oriented structure”, a “function-oriented structure” or a “location-oriented structure”. A specific constituent object may be of relevance in one structure only, or in more than one. For further information on structures and structuring (see IEC 81346-1:2009).

An object list is implicitly or explicitly associated with such a structure. The object list concept described in this International Standard is therefore applicable in all structures defined in accordance with IEC 81346-1:2009.

Object lists relevant to the manufacturing and assembly of a product, associated with the product-oriented structure, and generally named parts lists, usually cover only one assembly level each, and the main assembly is normally described by a system of single-level parts lists. An example of a system of single-level parts lists is shown in Figure 1.

Object lists are often generated as reports from a database containing information on the entire structure.



NOTE A is the main assembly; B, C, D and E are sub-assemblies; 1, 2, 3, etc. are parts. A, B, C, D and E are defined by single level parts lists, the content of each indicated by means of dashed lines.

Figure 1 – Illustration of the organization of object lists (in one aspect)

PREPARATION OF OBJECT LISTS, INCLUDING PARTS LISTS

1 Scope

This International Standard provides rules and guidelines for the presentation of information in object lists, and specific rules for such documents. It is applicable to object lists such as parts lists, function lists and location lists used in the design and engineering process intended to be supplied with the documentation.

NOTE 1 The scope of such object lists covers either an object with occurring constituents (c.f. IEC 81346-1:2009) or an assembly with types of constituents (c.f. ISO 7573).

NOTE 2 The role of such lists as a main document in structured documentation is described in IEC 62023:-.

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 61355:2008, *IEC Collection of standardized and established document kinds*, available at http://std.iec.ch/iec61355

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 62023[1], *Structuring of technical information and documentation*

IEC 62507-1:2010, *Identification systems enabling unambiguous information interchange – Requirements – Part 1: Principles and methods*

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

IEC 81346-2, *Industrial systems, installations and equipment and industrial products – Structuring principles and reference designations – Part 2: Classification of objects and codes for classes*

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

IEC/PAS 62569-1:2009, *Generic specification of information on products – Part 1: Principles and methods*

ISO 639-1, *Codes for the representation of names of languages – Part 1: Alpha-2 code*

ISO 6433, *Technical drawings – Item references*

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1 In preparation.

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

ISO 13584-42:2010, *Industrial automation systems and integration – Parts library – Part 42: Description methodology: Methodology for structuring parts families*

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 the terms is contained 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.

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 A system is generally defined with the view of achieving a given objective, e.g. by performing a definite function.

NOTE 2 Elements of a system may be natural or man-made material objects, as well as modes of thinking and the results thereof (e.g. forms of organisation, mathematical methods, programming languages).

NOTE 3 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 4 The term “system” should be qualified when it is not clear from the context to what it refers, e.g. control system, colorimetric system, system of units, transmission system.

NOTE 5 When a system is part of another system, it may be considered as an object as defined in this standard.

[IEC 81346-1:2009, definition 3.2]

3.1.3
aspect
specified way of viewing an *object*

[IEC 81346-1:2009, definition 3.3]

3.1.4
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]

3.1.5
occurrence (of an object)
particular case implying that an *object* appears in a *system*

3.1.6
domain
distinguished part of an abstract or physical space where something exists

NOTE A *domain* can be e.g. an *organization* or a country or a part of it.

[IEC 62507-1:2010, definition 3.2]

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 62507-1:2010, 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 Note that the term "*identifier*" as being an attribute and the term "*identification number*" as being the value of that attribute are here considered different things, but they are often mixed in existing definitions.

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* within a specified *domain*. An *object* may have more than one *identification number*.

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.

[IEC 62507-1:2010, definition 3.5]

3.1.9
domain number
domain ID
identification number assigned to a *domain*

NOTE An assigned domain number can coincide with the *organization ID.*

[IEC 62507-1:2010, definition 3.3]

3.1.10
reference designation
identifier of a specific *object* 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]

NOTE If a set of drawings for a product is structurally based on consist-of/is-part-of relations, part reference numbers are virtually the same thing as numeric product-oriented reference designations.

3.1.11
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]

3.1.12
part
material or functional element that is intended to constitute a component of a product

[ISO 13584-1 definition 3.1.16 modified]

3.1.13
part reference
identification of component *parts* of assemblies and/or the identification of individual *parts* on the same drawing

[ISO 7573, definition 3.2]

NOTE Part references are valid within the domain of an identified document (i.e. they refer to *occurring types* of *objects* in an identified *document*); as opposed to reference designations that are valid within of a defined structure (i.e. they refer to *occurrences* of sub-*objects* in an identified structure). Identical parts on a drawing are required to have the same part reference, preferably a number, according to ISO 6433, while each occurrence of an object in a structure is required to have a unique reference designation according to IEC 81346-1:2009.

3.1.14
part number
part ID
identification number of a *part*

3.1.15
characteristic property
defined parameter suitable for the description and differentiation of *objects*

NOTE The term *characteristic property* used in this standard is *not* identical with the term *data element type* used in IEC 61360-1:2009. A *data element type* is a unit of data for which the identification, description and value representation have been specified *in the context of a dictionary*, while the term *characteristic property* is used for an *occurrence* of such a *data element type in the context of a specification of an object*. This distinction makes it possible to qualify a characteristic property in an object specification and still refer to the same data element type definition in the dictionary.

The term used in IEC/PAS 62569-1:2009 is “property”, but it has been decided to change to “characteristic property” in this context since ISO uses “property” as synonym to “data element type”.

[based on IEC/PAS 62569-1:2009]

3.1.16
type
class of things having common characteristics

3.1.17
data element type
DET
unit of data for which the identification, description and value representation have been specified

[based on IEC 61360-1:2009, definition 2.3]

3.2 Terms related to documentation

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 No. 2)]

3.2.3
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]

3.2.4
document kind class
group of *document kinds* having similar characteristics concerning the content of information independent of the form of presentation

[IEC 61355-1:2008, definition 3.7]

3.3 Specific terms related to object lists

3.3.1
list item
presentation as part of a table or list of an ordered set of *characteristic property* values pertaining to one specific *object*

3.3.2
object list body
table containing *list items* specifying the *objects* that constitute an assembly (or sub-assembly) or *system* and, if necessary, reference documents

3.3.3
parts list body
object list body associated with the product-oriented *structure*

3.3.4
function list body
object list body associated with the function-oriented *structure*

3.3.5
location list body
object list body associated with the location-oriented *structure*

3.3.6
object list (document)
document mainly containing an *object list body* together with administrative *document* information

3.3.7
parts list (document)
object list mainly containing *a parts list body*

3.3.8
function list (document)
object list mainly containing *a function list body*

3.3.9
location list (document)
object list mainly containing a *location list body*

3.4 Alphabetical index of terms

Term	Term number
aspect	3.1.3
characteristic property	3.1.15
data element type	3.1.17
document	3.2.1
document ID	3.2.2
document kind	3.2.3
document kind class	3.2.4
document number	3.2.2
domain	3.1.6
domain ID	3.1.9
domain number	3.1.9
function list (document)	3.3.8
function list body	3.3.4
ID	3.1.8
identification number	3.1.8
identifier	3.1.7
list item	3.3.1
location list (document)	3.3.9

Term	Term number
location list body	3.3.5
object	3.1.1
object list (document)	3.3.6
object list body	3.3.2
occurrence (of an object)	3.1.5
part	3.1.12
part ID	3.1.14
part number	3.1.14
part reference	3.1.13
parts list (document)	3.3.7
parts list body	3.3.3
reference designation	3.1.10
reference designation set	3.1.11
structure	3.1.4
system	3.1.2
type	3.1.16

4 General

4.1 Types of object lists

Object lists are used to list and possibly specify the constituents of a system or product. With regard to the scope of object lists it is useful to differentiate among:

- "structure-based" object lists (in which the domain of validity is defined by the content (identified *occurrences* of sub-*objects*) of an *object* in a defined *structure*);
- "document-based" object lists (in which the domain of validity is defined by the content (identified *occurring types* of *objects*) of an identified *document)*.

NOTE In addition to the object lists specified in this standard there are, for example, "category-based" object lists like motor lists and valve lists used during the design and engineering process. Such lists can apply principles similar to those provided in this standard, but are not specifically treated here in.

Structure-based object lists can be further differentiated depending on the applied structure (see IEC 81346-1:2009):

- a *parts list* contains constituent objects in accordance with the product-oriented structure;
- a *function list* contains constituent objects in accordance with the function-oriented structure;
- a *location list* contains constituent objects in accordance with the location-oriented structure;
- etc.

Since the parts list is the most commonly used type of object list, this is in detail described in Clause 5. Other structure-based lists are organized in accordance with other structures as described above, but are otherwise constructed in the same way.

4.2 Forms of presentation of an object list body

An *object list body* is a tabular presentation of *list items* representing constituent objects of an object.

NOTE Parts and components are often used as alternative terms for constituent objects.

An object list body can be presented:

– in a basic object list document (see Clause 6), or

– as a part of a composite document, for example the drawing presenting the assembled object with which it is associated.

See Figure 2.

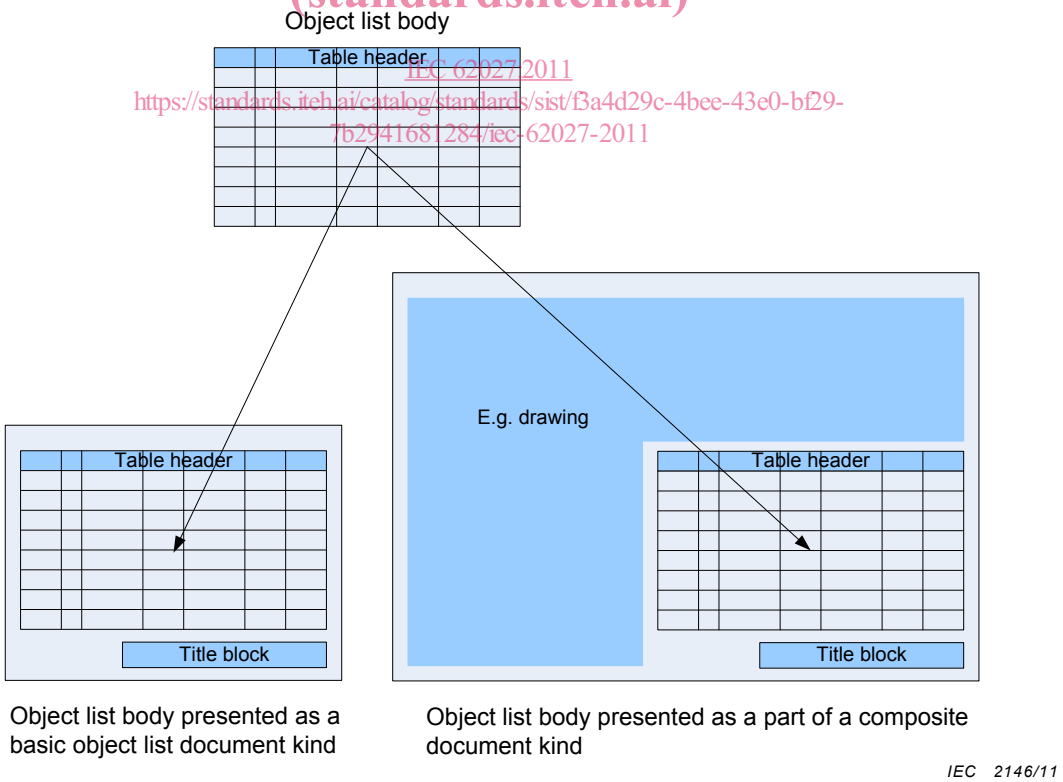

Figure 2 – Presentation of an object list body in a document

4.3 Table header

The table header defines the columns of the object list body. A column may be used to present the values of one or more characteristic properties.