BS EN 62027:2012

BSI Standards Publication

Preparation of object lists, including parts lists

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National foreword

This British Standard is the UK implementation of EN 62027:2012. It is identical to IEC 62027:2011. It supersedes BS EN 62027:2001, which is withdrawn.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

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EUROPÄISCHE NORM

EN 62027

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English version

Preparation of object lists, including parts lists
(IEC 62027:2011)

Etablissement des listes d'objet, y compris des nomenclatures de composants
(CEI 62027:2011)

Erstellung von Objektlisten, einschließlich Teilelisten
(IEC 62027:2011)

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European Committee for Electrotechnical Standardization
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Foreword

The text of document 3/1049/FDIS, future edition 2 of IEC 62027, 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 62027:2012.

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)	2012-08-16
• latest date by which the national standards conflicting with the document have to be withdrawn	(dow)	2014-11-16

This document supersedes EN 62027:2000.

EN 62027:2011 includes the following significant technical changes with respect to EN 62027:2000:

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

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 62027:2011 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 61360-1:2009	NOTE	Harmonized as EN 61360-1:2010 (not modified).
IEC 82045-1:2001	NOTE	Harmonized as EN 82045-1:2001 (not modified).
IEC 82045-2:2004	NOTE	Harmonized as EN 82045-2:2005 (not modified).
ISO 80000 series	NOTE	Harmonized in EN ISO 80000 series.
ISO 10303-44:1994	NOTE	Harmonized as ENV ISO 10303-44:1995 (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	2008	IEC Collection of standardized and established document kinds	-	-
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 62023	201X[1)]	Structuring of technical information and documentation	EN 62023	201X[1)]
IEC 62507-1	2010	Identification systems enabling unambiguous information interchange - Requirements - Part 1: Principles and methods	EN 62507-1	2011
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 81346-2	-	Industrial systems, installations and equipment and industrial products - Structuring principles and reference designations - Part 2: Classification of objects and codes for classes	EN 81346-2	-
IEC 82045-2	2004	Document management - Part 2: Metadata elements and information reference model	EN 82045-2	2005
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	EN ISO 6433	-
ISO 7200	-	Technical product documentation - Data fields in title blocks and document headers	EN ISO 7200	-

[1)] At draft stage.

Publication	Year	Title	EN/HD	Year
ISO 13584-42	2010	Industrial automation systems and integration - Parts library - Part 42: Description methodology: Methodology for structuring parts families	-	-

CONTENTS

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.

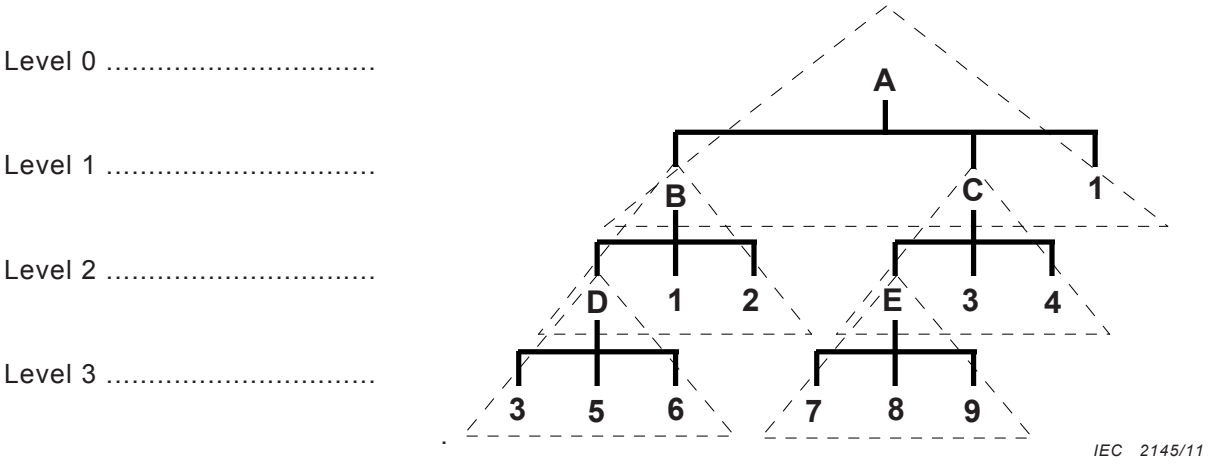
NOTE In the context of other standards, the term “item” is sometimes used with the same meaning as “object”.

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.

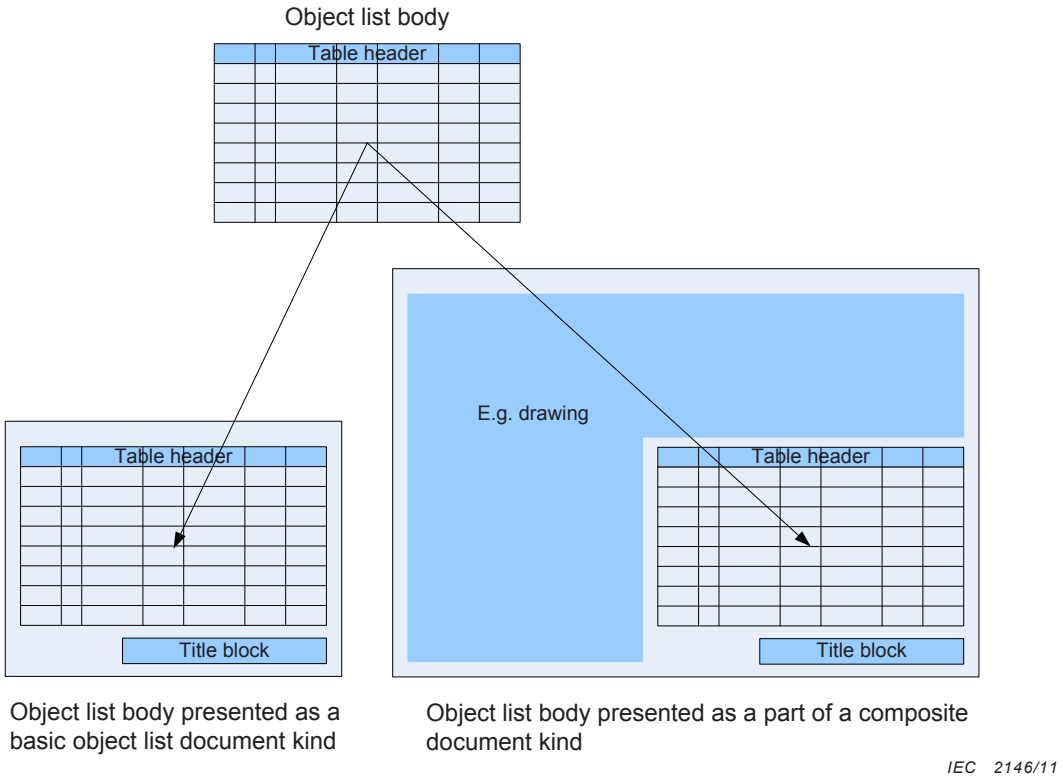

Figure 2 – Presentation of an object list body in a document

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.

4.4 List items

A list item in the object list represents one constituent object and presents the values of a selection of its characteristic properties. Every constituent object within the scope of the object list is represented by one list item; see also 5.3.

5 Requirements for the parts list body

5.1 Classification of parts lists

The following classes of parts lists are recognized in this International Standard.

Class A

Parts lists in which each list item represents a *type* (see 3.1.16) of a constituent object and specifies the amount of such types.

NOTE 1 Class A deals with “Summarized lists”; the amount is often greater than one for each type, the part number of each object may be used as ‘key’. This class of parts list is referred to as ”bill-of-material (BOM) data structure” in ISO 10303-44.

Class B

Parts lists in which each list item represents an *occurrence* (see 3.1.5) of a constituent object.

NOTE 2 For Class B the amount is in principle equal to one in each list item, the reference designation for the constituent object may be used as ‘key’. This class of parts list is referred to as “parts list data structure” in ISO 10303-44.

In cases where there is a need to specify a set of several identical objects, and if there is no need to distinguish between them in any context in the documentation, this set may be treated as one occurrence, in which the specified amount is larger than one. Example: the hundreds of light emitting diodes assembled to form a traffic signal.

Class A parts lists are commonly used in mechanical design of discrete objects, especially if only one structural level is covered by the parts list.

Class B parts lists are commonly used for electrical, fluid and other comprehensive systems, where there is a need to identify each occurrence of a type, for example for connection purposes.

In this International Standard, requirements for both classes are specified.

5.2 Relation to the specified object

Any document in design and engineering, including parts lists, should be related to one object.

The parts list shall list and possibly specify the constituent objects of that object. Each constituent object is presented by means of a list item.

A parts list may present one structural level only or one level together with one or more lower levels.

NOTE 1 For further information on the concept “object”, see IEC 81346-1:2009.

NOTE 2 For further information on the relation of "objects" to associated documents and documentation; see also IEC 61355-1:2008 and IEC 62023:-.

NOTE 3 Parts lists covering more than one structural level are referred to as “indented parts lists” in ISO 10303-44.

5.3 Content of a list item

The basic purpose of each list item is to associate the occurrence of a constituent object (Class B), or each identified group of objects of the same type (Class A), with a (type of) part.

The occurrence is identified by a reference designation or part reference and the part by a part number or global identification number.

In addition, other information on the occurrence and on the part may be provided to make the parts list more easily comprehensible and useful.

NOTE 1 In some cases there is a need to associate the occurrence of the constituent object not only with a part number, but also with a specific specimen of that type of part, identified by a serial number.

Each list item shall include the mandatory information specified in table 1 and should provide possibilities for inclusion of the conditional or optional information.

NOTE 2 For parts lists created from a database, system internal object identifiers may be needed. Such identifiers are not dealt with in this standard.

Table 1 – Information contained in a list item for a constituent object

Information	Class A	Class B	Reference to clause
Part reference	Mandatory		5.4.2 Identification of the occurrence
Amount	Mandatory	Conditional	5.4.6 Amount
Listing of reference designations	Conditional	-	5.4.2 Identification of the occurrence
Reference designation	-	Mandatory	5.4.2 Identification of the occurrence
Reference designation set	-	Conditional	5.4.2 Identification of the occurrence
Usage	-	Conditional	5.4.3 Usage
Occurrence-related technical data	-	Conditional	5.4.4 Characteristic properties related to the occurrence
Occurrence-related document reference	-	Conditional	5.4.5 References related to the occurrence
Part number, or	Mandatory	Mandatory	5.4.7 Identification of the type of part
Global identifier	Mandatory	Mandatory	5.4.7 Identification of the type of part
Part name	Mandatory	Mandatory	5.4.7 Identification of the type of part
Type designation	Conditional	Conditional	5.4.8 Description of the type of part
Specifying technical data	Conditional	Conditional	5.4.9 Characteristic properties for the type of part
Descriptive technical data	Optional	Optional	5.4.9 Characteristic properties for the type of part
Mass, dimensions	Conditional	Conditional	5.4.9 Characteristic properties for the type of part
Document reference	Optional	Optional	5.4.10 References to documents related to the type of part
Remark	Optional	Optional	
NOTE The terms used to specify the obligation have the following meaning in this table: Mandatory = always required Conditional = always required if the information is available Optional = user's choice			

5.4 Specification of characteristic properties

5.4.1 Overview

In this sub-clause, the information listed in table 1 is described in the following order:

a) information associated with the *occurrence* of the constituent object:
   1) identification of the occurrence;
   2) usage;
   3) occurrence-related technical data;
   4) reference(s) related to the occurrence;
b) information associated with amount and dimensions;
c) information associated with the *type* of the constituent object:
   1) identification of the type;
   2) description of the type;
   3) references related to the type.

Each characteristic property is in this standard specified by its name, definition, and possibly a comment.

For the rigorous identification and specification of the data element types used to express the characteristic properties reference is made to IEC 61360 DB and ISO 13584-42 compliant standards and to IEC 82045-2:2004.

5.4.2 Identification of the occurrence

The occurrence of a part shall be identified by at least one reference designation or a part reference.

Reference designation sets may also be provided. If a reference designation set is provided then the characteristic property “reference designation” is repeated once for each member of the set.

NOTE IEC 81346-1:2009 provides rules on how to present a reference designation set on one line. Example: A set consisting of the two reference designations =K1=B1 and +U5+U23 should be written =K1=B1/+U5+23.

Name	Definition	Comment
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)	For Class B lists, this property is used for the sorting of the list items.
Part reference	identification of component parts of assemblies and/or the identification of individual parts on the same drawing (ISO 6433)	For Class A lists, this property is used for the sorting of the list items. As one list item may cover several occurrences, the reference designation is in this case not suitable for sorting purposes.

NOTE The table heading “Name” above and in the following refers usually to the “Preferred name” defined for a DET, but may in some applications of object lists be replaced by a synonym to this.

5.4.3 Usage

If required, for lists of Class B, information should be added relating to the usage or purpose of the specific occurrence. Examples for a push-button: “Start”, “Stop”.

Name	Definition	Comment

Usage	free text description of the use or purpose of the object occurrence

5.4.4 Characteristic properties related to the occurrence

Technical data giving specific characteristics for the occurrence may be provided. Example: Pre-set value (selected within a “Setting range” relevant to the type).

The selection of relevant characteristic properties depends on the type of constituent object (component class), and cannot be generally specified. The referenced data element types should, if possible, be selected from valid international standards, such as IEC 61360 DB.

5.4.5 References related to the occurrence

Reference to documents giving information for adaptation of the specified type of part to the use in the specific occurrence, shall be given if necessary.

If necessary, references to other documents describing the occurrence of the constituent object, for example circuit diagrams or assembly drawings shall be provided.

For metadata associated with such document references, see 5.4.10.

For reference to a specific page and zone within a document the referencing rules of IEC 61082-1:2006 shall be applied.

5.4.6 Amount

The amount is either expressed as

- number of pieces;
- value, consisting of a measure together with a unit.

Name	Definition	Comment
Amount	number of pieces or a specifying value of identical specimen of the specified type	In many cases the term “quantity” is used for this concept, but this term may be misinterpreted in relation to the use of this term in the 80000-series of standards on Quantities and units prepared jointly by IEC and ISO.
Unit	the value of a quantity chosen by convention as a reference for measuring quantities of the same kind	Appropriate units for e.g. *length, area*, *volume* or *mass* are defined in ISO 1000. NOTE According to ISO 80000 the (language independent) unit symbol for *piece* is “1”.

5.4.7 Identification of the type of part

The identification of a type of part shall be done in one of the following two ways:

- by a part number (if necessary supplemented with specifying data) related to an organization, normally manufacturer or supplier, and an identifying code for this organization, or

- by a global identification, consisting of two parts: one part containing an identity number and another containing a domain ID specifying the domain in which the given identity number is unambiguous.

A part is a material or functional element that is intended to constitute a component of systems and products. A part can be referred to by its part number.

In many cases, the part is unambiguously specified by its part number (in the relevant domain) and in those cases the part number is sufficient for specification of all properties related to the part.

In other cases, the part is not unambiguously specified and in those cases the part number (or type designation) needs to be complemented by additional data for full specification.

NOTE This refers to cases where “variant design”, “parametric design”, etc., is applied in order to cover a large number of possible variants of a product/part with one or a few specifications.

The domain ID needs not be indicated if the part number belongs to a domain belonging to the organization issuing the parts list (with its name or logotype presented in the header or footer of the document).

If the part number is issued by a different (from the one presented in the header or footer of the document) organization, then the domain ID (which makes the part number globally unambiguous) shall be indicated.

As a simplification the domain ID may be replaced by a supplier code explained in the parts list or supporting documentation.

For further information on identification, please refer to IEC 62507-1:2010.

Name	Definition	Comment
Part number; object number	Identification number assigned to an object [IEC 62507-1:2010] identification number of a part [ISO 7573]	A part number shall be unambiguous within the domain identified by the domain ID.
Domain ID	identification number assigned to a domain [IEC 62507-1:2010]	Refer to IEC 62507-1:2010 for further information identification number domains.
Supplier code	identification code of a supplier within a specified context	Alias for the domain ID, explained in the object list or supporting documentation.

5.4.8 Description of the type of part

In addition to the identifying number for the part, information on the part name and type designation shall be provided.

Name	Definition	Comment
Part name; component description	free text description stated by the manufacturer of the part	The part name is the general name for a product, stated by the manufacturer, for example: “Auxiliary relay”, “Induction motor”, “Push-button”. NOTE From earlier days of computer processing, when memory space was limited, is inherited a field often called ”basic text”, containing a mixture of name + type designation + some essential properties - all abbreviated to fit into a fixed maximal format. Such information may be used as “part name” (or given additionally), but should be avoided since

Name	Definition	Comment
		it is not easily computer interpretable.
Type designation	encoded designation stated by the manufacturer of the part	A type designation relates the part to a "family of products", defined by the manufacturer. A type designation is normally not uniquely identifying a part in the same way as a part number, but is often used for convenience. NOTE The type designation is normally also to be found on the name plate of the technical object and in the manufacturer's documentation of it.

5.4.9 Characteristic properties for the type of part

Characteristic properties to be given in a parts list are of two kinds:

- specifying, and/or
- descriptive.

Specifying characteristic properties are technical properties that *are necessary* for the complete specification of the part, *given in addition* to the part number (or type designation) (see 5.4.7)

Descriptive characteristic properties are technical properties that give the most important characteristics of the specified part *suitable for functional studies, for commissioning, operation and maintenance on the actual assembly level*. This set is usually a subset of the properties available for the type of constituent object (product class) and cannot be generally specified.

The data element types used to express the characteristic properties should in both cases be selected form valid international standards, such as IEC 61360-DB.

Annex A provides further information on the creation of a descriptive set of information.

Example 1: Mass per piece is one such descriptive characteristic property, occurring so frequently that it has been given a separate column in the examples in Annex C and Annex D.

Example 2: Some standardized *types* of material and components (for example screws, bolts, nuts, sheet steel, etc) are described by a string composed of the standard number plus a selection of characteristic data. The rule for this composition is included in the relevant standard. For further information, see A.4.

5.4.10 References to documents related to the type of part

If necessary, references to documents describing the type of part in detail, for example a "Component specification" or a "Data sheet", shall be provided.

The reference shall be given by the document number and, if necessary for unambiguity, also by a revision index. If the issuer of the document is not the same as the issuer of the parts list information on the legal owner shall also be provided.

This information may be supported by a document kind classification code, language code, document kind designation and title.

Name	Definition	Comment
Legal owner	name of the organization that owns the copyright of the document	The name of the legal owner is needed in order to distinguish the document from other documents with the same identification number but owned by other organizations. The name can be expressed by clear text or by a domain ID.
Document number	identification number assigned to a document (IEC 82045-2:2004)	A document number shall be unambiguous within the domain identified by the domain ID.
Document kind	type of document defined with respect to its specified content of information and form of presentation (IEC 61355-1:2008)	Refer to IEC 61355 for relevant document kinds.
Revision index	identifier of a formally approved or intended to be approved document version (IEC 82045-2:2004)	The revision index is mandatory for all documents, which can be revised; if no other property (e.g. date of issue) is used for this purpose. The legal owner shall give rules for the update of a document. The revision state of the document may be related to the version of the product specified in that document. Synonymous names such as version code or revision number should be avoided.
Language code	identifier of the language(s) used in the document version in accordance with ISO 639-1 (IEC 82045-2:2004)	Codes for names of languages are given in ISO 639-1. The language code shall be expressed by lower-case letters, for example: en (English), jp (Japanese). In a multilingual document, the language codes have to be separated with a sign, e.g. a hyphen or a solidus.
Title	short clear text description of the content of a document (IEC 82045-2:2004)	The title gives a name to the content of a document and facilitates its understanding.

5.5 Layout of the parts list body

5.5.1 General

The parts list body shall be arranged as a table.

The table header defines the columns. The sequence of the columns may vary depending on user needs or routines. However, if no special reason for another sequence exists, the sequence indicated in 5.5.2 and 5.5.3 should be followed from left to right.

If one characteristic property only is presented in a column, then the name of the column should be the same as that of the property (in relevant language).

If one column is used to present many characteristic properties, then an appropriate collective name should be chosen.

If no confusion can arise, columns may be combined to a single column on the printed or visualized document.

5.5.2 Columns in Class A parts lists

The following columns and column names are recommended for Class A parts lists:

- part reference number;
- reference designations (containing “listing of reference designations”);
- amount;

- unit;
- part name;
- type designation;
- technical data (containing the appropriate selection of characteristic property values, including their units);
- mass per piece;
- part identifier (containing domain ID and part number).

For an example, see Annex C and Annex E. Annex E shows a minimum content parts list containing the mandatory data fields only.

5.5.3 Columns in Class B parts lists

The following columns and column names are recommended for Class B parts lists:

- reference designation;
- reference designation (second member of a reference designation set);
- description (containing ”part name” and “usage”);
- type designation;
- technical data containing the appropriate selection of property values, together with their units);
- mass per piece;
- part identifier (containing domain ID and part number).

If simplified presentation of reference designations in accordance with IEC 61082-1:2006 is applied, then the common portion of the reference designations shall be shown just below the column name in the reference designation columns and shall not be repeated in any list item.

For an example, see Annex D.

Note that the second column for reference designation is intended for a second member of a reference designation set.

A reference designation containing one or more changes of aspect is considered as one complete reference designation and shall not be split between columns.

5.5.4 List items

The volume of the information to be provided in a list item may require that several lines be used. To enhance readability in such cases, each list item should be clearly separated from the next, e.g. by a horizontal line.

5.5.5 Sorting of list items

To facilitate the reading of the parts list the sorting of the list items shall primarily be based on the reference designations or part references used in the structure that applies to the parts list. Sorting should proceed alphabetically (alphabetic/numeric) in ascending order. This implies that the list items, on each level in the structure, will be sorted according to the letter codes assigned in IEC 81346-2 and/or numerically.

Numbers in reference designations shall be sorted according to their mathematical value.

Example:

This way: A1, A2, A10, A11, A20

Not this way: A1, A10, A11, A2, A20.

NOTE Leading zeroes can be applied to enforce mathematical value sorting. According to IEC 81346-1:2009 leading zeroes should not have any significant meaning.

If multiple-level reference designation is applied in the parts list, then the sorting should proceed without regard to the “value” of the intermediate signs in the reference designation, since the characters =, +, -, etc. have no evident sorting value to a reader.

A reference designation set consists of two or more reference designations. Only one of these can be used as the primary key for sorting; the other members of the set are “other” designations that may be used as secondary or tertiary keys.

6 Requirements for an object list document

6.1 General

An object list document consists of document header/title block (see ISO 7200) and an object list body.

A object list document shall be identified with a separate document number and classified with a document kind designation code (see IEC 61355-1:2008), as it may be studied in conjunction with a number of other documents, for example assembly drawings, overview diagrams, circuit diagrams, maintenance instructions, fault-finding instructions.

NOTE For the associations of the object list to other documents, for example an assembly drawing, see IEC 62023:-.

6.2 Document kind names

Object list documents represent a document kind class of its own, see IEC 61355-1:2008. A multitude of document kind names is in use for object lists. In order to reduce this number, it is recommended to use the name “parts list”, “function list”, “location list”, etc. as appropriate related to the structure that governs its design and to specify the object to which it applies, and/or the purpose for which it is prepared or generated in the document title.

IEC 61355 DB lists a number of existing document kind names that are considered to be covered by this standard, and gives guidance on how these can be treated.

NOTE IEC 61355 DB provides document class codes (DCC) for document kinds, e.g. PB for parts list, PF for function list, PL for location list. However, if such a list serves the purpose of being a main document, in accordance with IEC 62023:-, its DCC should be AB.

Annex A
(informative)

Presentation of characteristic properties in a list item

A.1 General

As described in 5.3 an object being a constituent of an assembly is represented by a list item in the object list for this assembly. The occurrence of the object in the actual assembly is identified by means of a *reference designation*.

The detailed *specification* of it is identified by means of a *part numbe*r possibly supplemented with *specifying* characteristic properties.

It is *described* by a collection of *descriptive* characteristic properties, in principle taken from the set of characteristic properties related to the object referenced by the part number e.g. derived via its main document.

NOTE 1 For the basic information on the preparation and use of main documents, please refer to IEC 62023:-. Methods to specify characteristic properties of objects are further described in IEC/PAS 62569-1:2009.

The complete set of information describing the referenced object (available via its main document) is usually too comprehensive to be included as descriptive information in an object list or in any other document on a higher level in the structure. It is therefore necessary to create a suitable sub-set containing only those characteristic properties that are of relevance in this higher-level context.

NOTE 2 This requirement for higher-level instance information corresponds to the requirements for instance diagrams described in IEC 61082-1:2006.

It is not possible to formulate a general rule stating which characteristic properties should be included since this varies with the kind of object, the application context, and possibly also format restrictions in the system processing the object lists.

Apart from the entirely manual production of the subset during the generation of the object list, the following two methods (see A.2 and A.3) should be considered.

A.2 Fixed characteristic property information presentation

A dedicated characteristic property for *instance presentation* on the next higher structure level needs to be defined and stored for the referenced object. This characteristic property shall contain a selection of other *characteristic property values* (measure + unit) considered important for study in a higher level context.

When the object is used in an assembly the value of this characteristic property is to be used for presentation in the corresponding list item.

NOTE 1 The advantage with this method is that it is simple. The disadvantage is that care must be taken at revisions, since the content depends on other characteristic property values. Also, the resulting property content is not easily computer interpretable.

The source definition of the data element type is shown in B.2.2.

Example: For a squirrel cage motor presented in a higher-level parts list the value of the instance presentation property may be: ‘1465 1/min; 17 kW; 50 Hz; Y/D; 400/230 V’.

NOTE 2 The characteristic property ‘instance presentation’ may be further qualified in accordance with IEC/PAS 62569-1.

A.3 Rule-based characteristic property information presentation

A dedicated characteristic property for *instance presentation* on the next higher structure level is defined and stored for the referenced object. This characteristic property contains a list of identifiers for relevant characteristic properties or data element types. In addition it contains the identification of a *rule* for the interpretation of this information by the system that processes the object list.

When the object is used in an assembly the rule of this characteristic property is to be processed and the result to be used for presentation in the corresponding list item.

NOTE 1 This method is more complex but has the advantage that the values will always be updated.

The source definition of the data element type is shown in B.2.3.

Example: For a squirrel cage motor presented in a higher-level parts list the value of the instance presentation rule property (corresponding to the example in A.2) may be ’Rule X; AAE195; AAE182: AXY123; AXY345: AAE184’, which, when processed, results in a value (list of values) identical to that in the example of A.2.

NOTE 2 AAE195 etc. are identifiers of data element types. For example, AAE195 is the code for “rotational speed”.

NOTE 3 The characteristic property ‘instance presentation rule’ may be further qualified in accordance with IEC/PAS 62569-1.

A.4 Characteristic property information presentation for standardized material and components types

The principle described in A.2 is applied in some ISO standards for basic components (like screws, nuts and bolts) and material (like sheet steel and profiles), in which the type is defined by means of a string consisting of the identification number of the standard and some characteristic properties like designation and dimensions.

The applicable rule for the creation of the string is in each case shown in the actual standard. The rules may vary among the standards. It is therefore necessary include also the identification number of the standard in the string. The actual units for the characteristic properties are normally omitted.

Examples:

In accordance with ISO 4032 a hexagon nut, style 1, with thread M12 and property class 8 is to be designated:

Hexagon nut ISO 4032 – M12 -8

In accordance with ISO 657-1 an equal-leg angle with the dimensions A (length of the side) 20 mm, t (thickness) 3 and r_{root} (root radius) 3,5 mm is designated:

Equal-leg angle ISO 657-1 -20x20x3

Annex B
(normative)

Data element type definitions

B.1 General

Data Element Types (DETs) (sometimes also called “properties”) are used to unambiguously express characteristic properties for objects, especially when information is communicated between computers.

Once a DET is hosted in a dictionary, this can serve as an unambiguous common reference for the communication. This is vital for the support of electronic business.

The standardized full descriptions of DETs (providing all attributes in accordance with IEC 61360-1:2009) are contained in the IEC Component Data Dictionary (IEC CDD, IEC 61360-4), available at http://std.iec.ch/iec61360.

The present publication is the source standard for the data element types defined in B.2. For the purpose of this standard only a subset of the full descriptions are provided here: *identification number*, *preferred name* (possibly supplemented by *synonym name(s)* and *short name*) and *definition* (if necessary supplemented with a *note* or a *remark)*.

NOTE 1 The *identification number* is listed in the IEC CDD as *code* under which entry is stored in the dictionary.

NOTE 2 The attributes *preferred name* and *definition* are provided in the English language only, as the English language is the reference language of the IEC CDD. The IEC CDD allows adding national language variants to the dictionary under the control of the relevant National Committee.

NOTE 3 The DETs defined in the present standard have been forwarded for standardization and inclusion in the IEC CDD following the procedure defined in Annex J of *ISO/IEC Directives, IEC Supplement: Procedures specific to IEC*. The intent of this procedure is to make the DETs available in the IEC CDD at the time of publication of the present standard.

Other DETs referenced in this publication are listed in B.3. For these DETs the *identification number* with link is provided, if the DET is included in the IEC CDD at the time of preparation of this annex. These DETs are listed under their *preferred name*, with *synonyms* or *short names* indicated, if used in this publication. For metadata for documents references are made to IEC 82045-2:2004.

B.2 Source definition of DETs in this publication

B.2.1 Amount

Identification number (DET ID): AAF569

Preferred name: amount

Synonym: quantity

Definition: number of pieces of a specified type or a specifying value of it

B.2.2 Instance presentation

Identification number (DET ID): AAF566

Preferred name: instance presentation

Definition: free text description based on a subset of characteristic property values selected from the complete set of characteristic property values for an object, relevant for the description of this object as sub-objects in a higher level assembly

Remark: The description is intended for the presentation of an instance of a sub-object in the documentation of a higher-level assembly. The values should include the unit where appropriate and be separated.

B.2.3 Instance presentation rule

Identification number (DET ID): AAF567

Preferred name: instance presentation rule

Definition: set of data element type identification numbers (DET IDs) selected as a subset from the complete set of data element type identification numbers (DET IDs) for an object type

Remark: The application of the instance presentation rule allows on-line generation of values from a database for the presentation of a sub-object in the documentation of a higher-level assembly. The generated values should include the unit where appropriate and be separated.

B.2.4 Part reference

Identification number (DET ID): AAF549

Preferred name: part reference

Definition: identification of component parts of assemblies and/or the identification of individual parts on the same drawing

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.

B.2.5 Usage

Identification number (DET ID): AAF568

Preferred name: usage

Definition: free text description of the use or purpose of an occurring object

NOTE The usage may be different from the intended applications of the object as provided by its manufacturer.

B.3 Other DETs used with source definitions elsewhere

B.3.1 **body breath: AAE021**

B.3.2 **body height: AAE020**

B.3.3 **body length: AAE019**

B.3.4 **component description** (synonyms: part name; object name)**: AAE834**

B.3.5 **document kind code** (short name: DCC)**:** DocumentClassCodeIEC61355 [IEC 82045-2:2004]

B.3.6 **document kind:** DocumentClassNameIEC61355 [IEC 82045-2:2004]

B.3.7 **document number** (short name: document ID)**:** DocumentId [IEC 82045-2:2004]

B.3.8 **domain number** (short name: domain ID): **ADA002**

B.3.9 **identification number: AAA651**

B.3.10 **language code:** LanguageCode [IEC 82045-2:2004]

B.3.11 **mass (per piece): AAE752**

B.3.12 **object number** (synonym: part number)**: ADA003**

B.3.13 **organization number: ADA001**

B.3.14 **owner organization** (synonym: legal owner)**:** OrganizationOwner [IEC 82045-2:2004]

B.3.15 **reference designation set:** [not yet included in the IEC CDD]

B.3.16 **reference designation:** [not yet included in the IEC CDD]

B.3.17 **revision index:** DocumentRevisionId [IEC 82045-2:2004]

B.3.18 **title:** Title [IEC 82045-2:2004]

B.3.19 **type designation:** [not yet included in the IEC CDD]

Annex C
(informative)

Example of a parts list (object list) document with an parts list body of Class A

Part reference	Reference designation	Amount	Unit	Part name; Usage	Type designation	Technical data	Mass/unit	Identifier		Document ref.
							kg	Domain ID	Part number	
1	**-U1**	1	1	Base plate			40		6CVX3748	
2	**-G1**	1	1	Pump	AZG250	60 l/s; 15 m; 293 K	95		685T489-56	
3	**-X1**	1	1	Coupling			9	COPLEX	8KM6543-A	
4	**-M1**	1	1	Induction motor	HXR 180M4	18,5 kW; 400 V; 50 Hz; 1450 1/min; 35,4 A; IP55	100	**MCOMP**	**R31SMAOL1**	
5	**-U2**	1	1	Mounting plate			5		6CVX7865	
6	**-W1**	2	m	Cable (prefab)			1		6CVX 9876-1	

See Annex E.

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	Pump assembly	ABCD34567		2	1/1
				Document designation -G1**&PB**		Revision index	Page 1/1
Released date / by	Status	Supplier	Document kind	Supplier document number	Language	Revision index	Page
2009-12-15	As built	**Pump Company Ltd**	PARTS LIST	6CVX12345	en	5	1/1

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Annex D
(informative)

Example of a parts list (object list) document with a parts list body of Class B

Reference designation set		Part name; Usage	Type designation	Technical data	Mass/unit	Identifier		Document ref.
-G1	=				kg	Domain ID	Part number	
-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.								

See Annex E.

Prepared date / by 2009-12-01 AB	Approved date / by 2009-12-10 CD	Plant / Project Plant Company Ltd	Object Pump assembly	Plant owner document number ABCD34567		Revision index 2	Page 1/1
				Document designation -G1**&PB**		Revision index	Page 1/1
Released date / by 2009-12-15	Status As built	Supplier **Pump Company Ltd**	Document kind PARTS LIST	Supplier document number 6CVX12345	Language en	Revision index 5	Page 1/1

Annex E
(informative)

Example of a parts list document for manufacturing purposes with a parts list body of Class A

Part reference	Amount	Unit	Part name	Identifier	
				Domain ID	Part number
11	1	1	Stator		R31SMCOL1
12	1	1	End shield		R31L1
13	1	1	End shield		R31L2
16	1	1	Shaft		R31SMR1
17	8	1	Screw		FLSKM2OX70/70Y
18	1	1	Ball bearing	SKF	EBKL6319/C3
20	1	1	Ring		HX35LJ1
24	1	1	Ball bearing	SKF	EBKL6316/C3
26	1	1	Ring		HX56LJ1
30	1	1	Spring		YPRA316/1
32	1	1	Washer		FSTB80X2,5
34	1	1	Bearing housing		HX63LF3
36	1	1	Bearing housing		HX56LF1
38	1	1	Bearing		HX35LH1
40	1	1	Plug		FFTN-R3/4
42	1	1	V-ring		YJSFS95
45	1	1	Bearing cap		HX56LH1/2
47	1	1	V-ring		YJFS80
49	8	1	Screw		FLSKM10X80/80Y
51	1	1	Nipple		ZLZLB-M10X1
53	1	1	Nipple		ZLZLA-M10X1
55	1	1	Nipple		R20LDJ1
59	2	1	Nipple		CXBY66908
61	1	1	Fan		HX63T14/1
63	1	1	Ring	CONTI	ZYEA80X30
65	2	1	Washer		FSTB80X2,5
67	1	1	Cover		R31U2
69	4	1	Screw		FLHSUM10X20/20Y
70	4	1	Washer		FAOA10.5Y

Revision index	Document reference	Prepared	Approved	Released
B	HXR315SM40-B	1999-07-08 by XX	1999-08-10 by NN	1999-09-01 by MM
A	HXR315SM40-A	1998-05-08 by XX	1998-06-10 by NN	1998-06-15 by MM
-	-	1995-02-08 by XX	1995-03-10 by NN	1995-05-09 by MM

Responsible department	Object	Document designation		Revision index	Page
PQR	Induction motor, 3 phase squirrel cage Type HXR 315SM4	HXR315SM4**&PB**		B	1/2
Manufacturer	Document kind	Supplier document number	Language	Revision index	Page
Motor Company Ltd	PARTS LIST	R31SMAOL1	en	B	1/2

Part reference	Amount	Unit	Part name	Identifier	
				Domain ID	Part number
71	4	1	Sealing		ECUA63
72	4	1	Box		YDDD16/10.2X8
73	1	1	Key		ZDER22N14X125
75	1	1	Shield		YKLP7069
77	4	1	Nail		FZKU2.9X5

Assembly drawing: H320919

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

ISO 80000 (all parts), *Quantities and units*

ISO 657-1:1989, *Hot-rolled steel sections – Part 1: Equal-leg angles – Dimensions*

ISO 7573:2008, *Technical product documentation - Parts lists*

ISO 10303-44:1994, *Industrial automation systems and integration – Product data representation and exchange – Part 44: Integrated generic resources: Product structure configuration*

ISO/IEC 11179-3:1994, *Information technology – Specification and standardization of data elements – Part 3: Basic attributes of data elements*

ISO 13584-1:2001, *Industrial automation systems and integration – Parts library – Part 1: Overview and fundamental principles*

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