



SLOVENSKI STANDARD

SIST EN 81346-1:2009

01-december-2009

Nadomešča:

SIST EN 61346-1:1997

Industrijski sistemi, inštalacije in oprema ter industrijski izdelki - Načela strukturiranja in referenčne oznake - 1. del: Osnovna pravila (IEC 81346-1:2009)

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

Industrielle Systeme, Anlagen und Ausrüstungen und Industrieprodukte - Strukturierungsprinzipien und Referenzkennzeichnung - Teil 1: Allgemeine Regeln (IEC 81346-1:2009)

<http://standards.iteh.ai>

Systèmes industriels, installations et appareils, et produits industriels - Principes de structuration et désignations de référence - Partie 1: Règles de base (CEI 81346-1:2009)

Ta slovenski standard je istoveten z: EN 81346-1:2009

ICS:

01.110	Tehnična dokumentacija za izdelke	Technical product documentation
29.020	Elektrotehnika na splošno	Electrical engineering in general

SIST EN 81346-1:2009

en,fr

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN 81346-1:2009

<https://standards.iteh.ai/catalog/standards/sist/5e130455-77e5-4330-95b1-dc6dbd780ad3/sist-en-81346-1-2009>

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 81346-1

October 2009

ICS 01.110; 29.020

Supersedes EN 61346-1:1996

English version

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

Systèmes industriels, installations
et appareils, et produits industriels -
Principes de structuration
et désignations de référence -
Partie 1: Règles de base
(CEI 81346-1:2009)

Industrielle Systeme, Anlagen
und Ausrüstungen und Industrieprodukte -
Strukturierungsprinzipien
und Referenzkennzeichnung -
Teil 1: Allgemeine Regeln
(IEC 81346-1:2009)

**iTeh STANDARD PREVIEW
(standards.iteh.ai)**

This European Standard was approved by CENELEC on 2009-08-01. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

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

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the Central Secretariat has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

CENELEC

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

Central Secretariat: Avenue Marnix 17, B - 1000 Brussels

Foreword

The text of document 3/947/FDIS, future edition 1 of IEC 81346-1, prepared by IEC TC 3, Information structures, documentation and graphical symbols, in close co-operation with ISO TC 10, Technical product documentation, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 81346-1 on 2009-08-01.

This European Standard supersedes EN 61346-1:1996.

EN 81346-1:2009 includes the following substantial changes with respect to EN 61346-1:1996:

- a new introductory clause providing a description and explanation to the concepts used elsewhere in the publication;
- a more comprehensive description of the structuring principles and rules for structuring are provided;
- “other aspects” are introduced, and the prefix sign # is assigned to these aspects;
- the concept of reference designation group has been deleted;
- the specific term “transition” has been avoided and been replaced by an improved textual description of this phenomenon in Annex D;
- a new clause about labelling is introduced;
- the old annexes have been removed with the exception of the annex showing an example of the application of reference designations within a system;
- a new annex explaining the manipulation of objects is introduced;
- 4 new annexes are introduced as rearrangement of detailed examples or explanatory information.

The following dates were fixed:
<http://standards.iteh.ai/catalog/standards/sist/5e130455-77e5-4330-95b1-dc6dbd780ad3/sist-en-81346-1-2009>

- latest date by which the EN has to be implemented
at national level by publication of an identical
national standard or by endorsement (dop) 2010-05-01
- latest date by which the national standards conflicting
with the EN have to be withdrawn (dow) 2012-08-01

Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 81346-1:2009 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 60297-3-101	NOTE	Harmonized as EN 60297-3-101:2004 (not modified).
IEC 61082-1	NOTE	Harmonized as EN 61082-1:2006 (not modified).
IEC 61335-1	NOTE	Harmonized as EN 61335-1:2008 (not modified).
IEC 62023	NOTE	Harmonized as EN 62023:2000 (not modified).
IEC 62027	NOTE	Harmonized as EN 62027:2000 (not modified).
IEC 62491	NOTE	Harmonized as EN 62491:2008 (not modified).
IEC 81346-2	NOTE	Harmonized as EN 81346-2:2009 (not modified).
ISO 3166-1	NOTE	Harmonized as EN ISO 3166-1:2006 (not modified).
ISO 4157	NOTE	Harmonized in EN ISO 4157 series (not modified).

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[SIST EN 81346-1:2009](#)

<https://standards.iteh.ai/catalog/standards/sist/5e130455-77e5-4330-95b1-dc6dbd780ad3/sist-en-81346-1-2009>

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.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
ISO/IEC 646	- ¹⁾	Information technology - ISO 7-bit coded character set for information interchange	-	-

iTeh STANDARD PREVIEW (standards.iteh.ai)

[SIST EN 81346-1:2009](https://standards.iteh.ai/catalog/standards/sist/5e130455-77e5-4330-95b1-dc6dbd780ad3/sist-en-81346-1-2009)

<https://standards.iteh.ai/catalog/standards/sist/5e130455-77e5-4330-95b1-dc6dbd780ad3/sist-en-81346-1-2009>

¹⁾ Undated reference.



IEC 81346-1

Edition 1.0 2009-07

INTERNATIONAL STANDARD

NORME INTERNATIONALE



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

**Systèmes industriels, installations et appareils et produits industriels –
Principes de structuration et désignations de référence –
Partie 1: Règles de base**

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

COMMISSION
ELECTROTECHNIQUE
INTERNATIONALE

PRICE CODE
CODE PRIX

XC

CONTENTS

FOREWORD.....	6
INTRODUCTION.....	8
0.1 General.....	8
0.2 Basic requirements for this standard	8
0.3 Required properties of the standard	9
1 Scope.....	11
2 Normative references	11
3 Terms and definitions	11
4 Concepts.....	13
4.1 Object	13
4.2 Aspect.....	14
4.3 Technical system.....	15
4.4 Structuring	16
4.5 Function	16
4.6 Products and components	16
4.7 Location	17
4.8 Types, occurrences and individuals.....	18
5 Structuring principles.....	20
5.1 General.....	20
5.2 Forming structures (i.e. types and occurrences).....	21
5.3 Function-oriented structure.....	24
5.4 Product-oriented structure.....	25
5.5 Location-oriented structure.....	26
5.6 Structures based on “other aspects”	27
5.7 Structures based on more than one aspect.....	28
6 Construction of reference designations.....	29
6.1 General.....	29
6.2 Format of reference designations	29
6.2.1 Single level.....	29
6.2.2 Multi-level.....	30
6.2.3 Use of letter codes	31
6.3 Different structures within the same aspect	31
7 Reference designation set.....	32
8 Designation of locations	33
8.1 General.....	33
8.2 Assemblies.....	33
9 Presentation of reference designations.....	35
9.1 Reference designations	35
9.2 Reference designations set	36
9.3 Presentation of identifiers for the top-node	37
10 Labelling	38
Annex A (informative) Historical background.....	39
Annex B (informative) Establishment and life cycle of objects	41
Annex C (informative) Manipulation of objects	52
Annex D (informative) Interpretation of reference designations using different aspects	64

Annex E (normative) Object represented with several top nodes in an aspect	67
Annex F (informative) Examples of multiple structures based on the same aspect	69
Annex G (informative) Example of structures and reference designations	73
Annex H (informative) Example of reference designations within a system	75
Bibliography	82
Figure 1 – International standards providing a consistent system for designation, documentation and presentation of information	10
Figure 2 – Illustration of an object	13
Figure 3 – Aspects of an object	15
Figure 4 – Illustration of a function and its sub-functions	16
Figure 5 – Illustration of the concepts product, component, type, individual and occurrence	19
Figure 6 – Illustration of structural decomposition of an object from different aspects	20
Figure 7 – Illustration of a function-oriented decomposition and product-oriented composition	21
Figure 8 – Structure tree of object A (alternative 1)	22
Figure 9 – Structure tree of object A (alternative 2)	22
Figure 10 – Constituents in one aspect of object type 1	23
Figure 11 – Constituents in one aspect of object type 2	23
Figure 12 – Constituents in one aspect of object type 5	23
Figure 13 – Structure tree of object type 1	24
Figure 14 – Illustration of a function-oriented structure	25
Figure 15 – Illustration of a product-oriented structure	26
Figure 16 – Illustration of a location-oriented structure	27
Figure 17 – Example of the use of “other aspect”	28
Figure 18 – Illustration of an object accessible from three aspects, and where these aspects are used also for internal structuring	28
Figure 19 – Illustration of an object identified by means of one aspect and with sub-objects identified by means of another aspect	29
Figure 20 – Examples of single-level reference designations	30
Figure 21 – Relation between a multi-level reference designation and its single-level reference designations	30
Figure 22 – Examples of multi-level reference designations with multiple prefix signs	31
Figure 23 – Example of reference designation sets	32
Figure 24 – Example of designation of mounting planes inside a factory build assembly	34
Figure 25 – Examples of designation of locations inside a factory build assembly	35
Figure 26 – Examples of presentations of multi-level reference designations	36
Figure 27 – Presentation of reference designations of a reference designation set	37
Figure 28 – Different objects on a site identified with top node identifiers	37
Figure 29 – The common initial portion of reference designations	38
Figure 30 – Labelling of reference designations	38
Figure A.1 – Scope of reference designation standards	39
Figure B.1 – Development situations of an object	41
Figure B.2 – The object’s life cycle	44

Figure C.1 – Integration of external information by copying	53
Figure C.2 – Integration of an external object by referencing	54
Figure C.3 – Three independently defined objects	54
Figure C.4 – Three separate objects with mutual relations	55
Figure C.5 – The three objects are merged into one.....	55
Figure C.6 – Overview of the process system	56
Figure C.7 – Tree-like structures of the technical system	57
Figure C.8 – Completed structures of the technical system	58
Figure C.9 – Structures with designated sub-objects.....	58
Figure C.10 – Structures with some merged-and shared objects	59
Figure C.11 – Relations expressed by reference designation sets in which both designations are unambiguous.....	60
Figure C.12 – Relations expressed by reference designation sets in which one designation is ambiguous.....	60
Figure C.13 – Situations in the beginning of an object's life cycle accessible from three aspects	61
Figure C.14 – Situations in the beginning of the life cycle of closely related objects, each accessible from one aspect	62
Figure D.1 – Shift from function to product aspect.....	64
Figure D.2 – Shift from product to function aspect.....	64
Figure D.3 – Shift from product to location aspect.....	65
Figure D.4 – Shift from location to product aspect.....	65
Figure D.5 – Shift from function to location aspect.....	66
Figure D.6 – Shift from location to function aspect.....	66
Figure E.1 – Object represented with several independent top nodes in one aspect.....	67
Figure E.2 – Example of multi-level reference designations using different aspects of an object with several independent top nodes in one aspect	68
Figure F.1 – Illustration of the concept of additional functional views of an industrial process plant	69
Figure F.2 – Location-oriented structure of a plant.....	70
Figure F.3 – Location-oriented structure within an assembly unit	70
Figure F.4 – Location-oriented structures of the plant	71
Figure F.5 – Example of additional product-oriented structures	72
Figure G.1 – Function-oriented structure of object type 1	73
Figure G.2 – Function-oriented structure of object type 2.....	73
Figure G.3 – Function-oriented structure of object type 5.....	73
Figure G.4 – Concatenated function-oriented structure tree of object type A	74
Figure H.1 – Process flow diagram for a material handling plant	75
Figure H.2 – Overview diagram of part of the process system (=V1) and part of the power supply system (=G1)	76
Figure H.3 – Structure tree for parts of the material handling plant	77
Figure H.4 – Layout drawing of the components of the MCC =G1=W1	78
Figure H.5 – Layout drawing of the locations of the MCC =G1=W1	79
Figure H.6 – Motor starter.....	79
Figure H.7 – Product- and location-oriented structure trees for the MCC.....	80

Table 1 – Identification of types, occurrences and individuals within different contexts	19
Table C.1 – Possible reference designation sets	59
Table H.1 – Reference designation set for the constituents of the products MCC and motor starter	81

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[SIST EN 81346-1:2009](https://standards.iteh.ai/catalog/standards/sist/5e130455-77e5-4330-95b1-dc6dbd780ad3/sist-en-81346-1-2009)

<https://standards.iteh.ai/catalog/standards/sist/5e130455-77e5-4330-95b1-dc6dbd780ad3/sist-en-81346-1-2009>

INTERNATIONAL ELECTROTECHNICAL COMMISSION

**INDUSTRIAL SYSTEMS, INSTALLATIONS
AND EQUIPMENT AND INDUSTRIAL PRODUCTS –
STRUCTURING PRINCIPLES AND REFERENCE DESIGNATIONS –**

Part 1: Basic rules

FOREWORD

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
- 2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
- 3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
- 4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
- 5) IEC provides no marking procedure to indicate its approval and cannot be rendered responsible for any equipment declared to be in conformity with an IEC Publication.
- 6) All users should ensure that they have the latest edition of this publication.
- 7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
- 8) Attention is drawn to the normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
- 9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 81346-1 has been prepared by IEC technical committee 3: Information structures, documentation and graphical symbols, in close co-operation with ISO technical committee 10: Technical product documentation.

It is published as a double logo standard.

This edition cancels and replaces the first edition of IEC 61346-1, published in 1996. This edition constitutes a technical revision.

This edition includes the following substantial changes with respect to the first edition of IEC 61346-1:

- a new introductory clause providing a description and explanation to the concepts used elsewhere in the publication;
- a more comprehensive description of the structuring principles and rules for structuring are provided;

- “other aspects” are introduced, and the prefix sign # is assigned to these aspects;
- the concept of reference designation group has been deleted;
- the specific term “transition” has been avoided and been replaced by an improved textual description of this phenomenon in annex D;
- a new clause about labelling is introduced;
- the old annexes have been removed with the exception of the annex showing an example of the application of reference designations within a system;
- a new annex explaining the manipulation of objects is introduced;
- 4 new annexes are introduced as rearrangement of detailed examples or explanatory information.

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

FDIS	Report on voting
3/947/FDIS	3/958/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. In ISO, the standard has been approved by 12 members out of 13 having cast a vote.

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

A list of all parts of the International Standard 81346 series, formerly IEC 61346 series, under the general title *Industrial systems, installations and equipment and industrial products – structuring principles and reference designations*, can be found on the IEC website.

Future standards in this series will carry the new general number 81346. Numbers of existing standards in this series will be updated at the time of the next edition.

The committee has decided that the contents of this publication will remain unchanged until the maintenance result 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.

IMPORTANT – The “colour inside” logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this publication using a colour printer.

INTRODUCTION

0.1 General

This standard establishes a further development of earlier and withdrawn standards (IEC 60113-2, IEC 60750) on item designation, see Annex A. It provides basics for establishing models of plants, machines, buildings etc.

The standard specifies:

- principles for structuring of objects including associated information;
- rules on forming of reference designations based on the resulting structure.

By applying the structuring principles, even very large sets of information in a complex installation can be handled efficiently.

The structuring principles and the rules for reference designations are applicable to objects of both physical and non-physical character.

The structuring principles and the rules for reference designations provide a system that is easy to navigate within and easy to maintain. This system provides an excellent overview on a technical system since composite structures are simple to establish and understand.

The structuring principles and the rules for reference designations support alternative design and engineering processes in the life cycle of an object since they are based on the successively established results of this process and not on how the engineering process itself is carried out.

[SIST EN 81346-1:2009](https://standards.iteh.ai/catalog/standards/sist/5e130455-77e5-4330-95b1-de6dbd780ad3/sist-en-81346-1-2009)

The structuring principles and the rules for reference designations allow, by accepting more than one aspect, that more than one coding principle can be applied. This technique also allows 'old structures' to be handled together with 'new structures' by using multiple unambiguous identifiers.

The structuring principles and the rules for reference designations support individual management for the establishment of reference designations, and enable subsequent integration of modules into larger constructs. They also support the establishment of reusable modules, either as functional specifications or as physical deliverables.

NOTE The concept of reusable modules encompasses for example, for manufacturers: the establishment of contract independent modules, and, for operators of complex assemblies: the description of requirements in terms of supplier independent modules.

The structuring principles and the rules for reference designations support concurrent work and allow different partners within a project to add and / or remove data to the structured project result as it proceeds.

The structuring principles and the rules for reference designations recognize time factor within the life-cycle as important for the application of different structures based on different views on the considered technical system.

0.2 Basic requirements for this standard

The basic requirements were developed during the preparation of IEC 61346-1 Ed. 1, and accepted by vote by the national committees.

NOTE These basic requirements concern the development of the structuring principles in this standard and not its application. They are therefore not normative vis-à-vis the application of this standard.

- This standard should be applicable to all technical areas and enable a common application.
- This standard shall be applicable to all kind of objects and their constituents, such as plants, systems, assemblies, software programs, spaces, etc.
- This standard should be capable of being consistently applied in all phases (i.e. conceptual development, planning, specification, design, engineering, construction, erection, commissioning, operation, maintenance, decommissioning, disposal, etc.) of the life time of an object of interest, i.e. an object to be identified.
- This standard shall provide the ability to identify unambiguously any single object being a constituent of another object.
- This standard shall support the incorporation of sub-object structures from multiple organizations into objects from other organizations without change to the original object structures and neither to the sub-object structures nor any of their documentation.
- This standard shall support a representation of an object independently of the complexity of the object
- This standard should be easy to apply and the designations should be easy for the user to understand.
- This standard should support the use of, and should be able to be implemented by, computer-aided tools for conceptual development, planning, specification, design, engineering, construction, erection, commissioning, operation, maintenance, decommissioning, disposal, etc.

0.3 Required properties of the standard

iTech STANDARD PREVIEW
(standards.iteh.ai)

The required properties were developed during the preparation of IEC 61346-1 Ed. 1, and accepted by vote by the national committees.

NOTE 1 These required properties concern the development of the letter code classification system in this standard and not its application. They are therefore not normative vis-à-vis the application of this standard.

- This standard shall not contain rules and restrictions that prohibit its use within a technical area.
- This standard shall cover all its foreseeable applications within all technical areas.
- This standard shall support addressing of information to objects at all phases in their life time.
- This standard shall allow construction of designations at any time from the currently available information.
- This standard shall support the identification of objects based on a constituency principle.
- This standard shall contain rules that enable the formulation of unambiguous designations.
- This standard shall be open and allow a designation to be extended.
- This standard shall support modularity and reusability of objects.
- This standard shall support the description of different users' views on the object
- This standard shall provide rules for the interpretation of designations where needed.

Figure 1 provides an overview on international standards providing a consistent system for designation, documentation and presentation of information.