

# INTERNATIONAL STANDARD

# NORME INTERNATIONALE



HORIZONTAL PUBLICATION  
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**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**





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IEC Secretariat  
3, rue de Varembe  
CH-1211 Geneva 20  
Switzerland

Tel.: +41 22 919 02 11  
[info@iec.ch](mailto:info@iec.ch)  
[www.iec.ch](http://www.iec.ch)

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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

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**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.
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IEC 81346-1 has been prepared by IEC technical committee 3: Documentation, graphical symbols and representations of technical information, in close cooperation with ISO technical committee 10: Technical product documentation. It is an International Standard.

It is published as a double logo standard and has the status of a horizontal publication in accordance with IEC Guide 108.

This second edition cancels and replaces the first edition published in 2009. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

- a) the scope includes a reference to IEC Guide 108 for being a horizontal publication;
- b) synchronization with IEC 81346-2:2019 and ISO 81346-12:2018;

- c) the introduction of the type aspect;
- d) introduction of an information model of the reference designation system;
- e) introduction of an information model for the framework of reference designation system to comply with International Standard 81346 series;
- f) introduction of recommendation for metadata for design structure management;
- g) introduction of rules and method for designation of relations between objects;
- h) introduction of requirements for development of sector-specific parts of the International Standard 81346 series;
- i) introduction of requirements for incorporation of sub-object in object structures;
- j) introduction of recommendations for documentation of the application of the International Standard 81346 series;
- k) introduced definition of new terms used;
- l) new rules added and existing rules modified;
- m) notes related to rules are converted to normative text as "Comment to Rule nn".

The text of this International Standard is based on the following documents:

Draft	Report on voting
3/1541/FDIS	3/1548/RVD

Full information on the voting for its approval can be found in the report on voting indicated in the above table. In ISO, the standard has been approved by 10 members out of 11 having cast a vote.

The language used for the development of this International Standard is English.

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

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at [www.iec.ch/members\\_experts/refdocs](http://www.iec.ch/members_experts/refdocs). The main document types developed by IEC are described in greater detail at [www.iec.ch/standardsdev/publications](http://www.iec.ch/standardsdev/publications).

In this document, *italic type* is used as follows:

- terms defined in Clause 3 (applies to the text of Clause 3 only);
- in the description of the EXPRESS model, entity names and attribute identifiers;
- commenting on the story from a structuring and reference designation perspective in Clause B.2.

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## INTRODUCTION

This document establishes a further development of earlier and withdrawn standards on item designation. It provides the basics for establishing models of plants, machines, buildings, infrastructure, etc.

This document 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 describing a complex system can be handled efficiently. In Annex B, the life-cycle story of an object shows how different structures and aspects are related to the sets of information.

The structuring principles and the rules for reference designations:

- are applicable to objects of both physical and non-physical character;
- provide a system that is easy to navigate within and easy to maintain;
- provide an excellent overview on a technical system since composite structures are simple to establish and understand;
- 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;
- allow, by accepting more than one aspect, that more than one coding principle can be applied;
- allow "old structures" to be handled together with "new structures" by using multiple unambiguous identifiers;
- support individual management for the establishment of reference designations and enable subsequent integration of modules into larger constructs;
- 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.

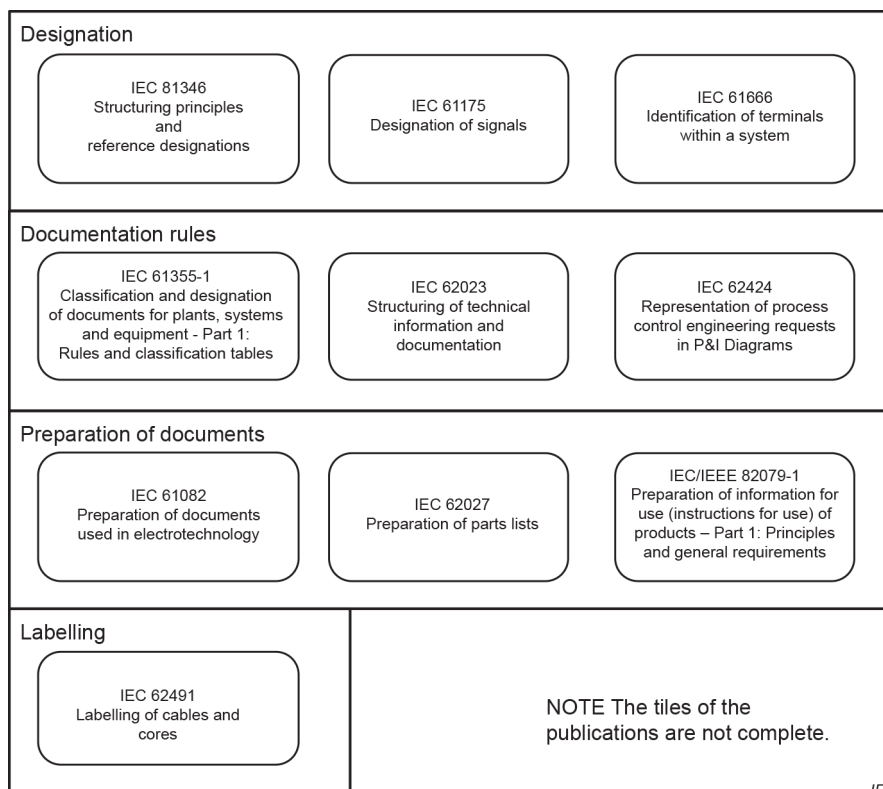
- support concurrent work and allow different partners within a project to add and/or remove data to the structured project result as it proceeds; and
- recognize time factor within the life cycle as important for the application of different structures based on different views on the considered technical system.

The rules for structuring of information and for the construction of reference designations forms the basis for creating a reference designation system (RDS) complying with the International Standard 81346 series. Such systems are used for structuring and designating objects based on the needs of the organization using them.

The rules listed above are based on the fundamental ideas provided in Annex M that were defined for the development of the predecessor document for this document.

Annex A provides an information model of the framework described in this document and in IEC 81346-2. Annex A includes also elements related to other publications where the application of the reference designation in accordance with International Standard 81346 is considered.

Figure 1 provides an overview on International Standards providing a consistent system for designation, documentation, and presentation of information. Annex A provides more information on the relations between the International Standard 81346 series and other publications applying reference designations.



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**Figure 1 – International Standards providing a consistent system for designation, documentation and presentation of information**

This document describes the fundamental rules and methods for structuring of information and for the definition of reference designation of objects within buildings, infrastructure, industrial systems, installations and equipment and industrial products. These rules form a basis for the establishment of specific reference designation systems (RDS) for use by industries, enterprises, projects or other organizational contexts.

IEC 81346-2 establishes classification schemes with defined object classes and their associated letter codes. It is primarily intended for use in reference designations and for designation of generic types. Classes can also be used for other purposes, for example, by manufacturers to show multiple potential use of a product. In this way, the classification can enhance searchability.

Used in combination, this document and IEC 81346-2 define a fundamental framework for reference designations that is independent of the context in which reference designations are applied. This is applicable for objects in all technical disciplines and all branches of industry, and is applicable through the whole life-cycle of objects.

The International Standard 81346 series additionally includes parts that define sector-specific reference designation frameworks that tailor the fundamental reference designation framework of this document and IEC 81346-2 to the needs of specific sectors. Requirements for developing sector-specific parts of the International Standard 81346 series are given in Annex J.