

# SVENSK STANDARD

## SS-ISO 81346-12:2019



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### **Struktureringsprinciper och referensbeteckningar – Del 12: Bygg- och installationssystem (ISO 81346-12:2018, IDT)**

**Industrial systems, installations and equipment and industrial  
products – Structuring principles and reference designations –  
Part 12: Construction works and building services  
(ISO 81346-12:2018, IDT)**

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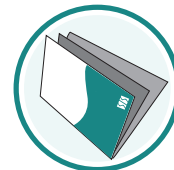
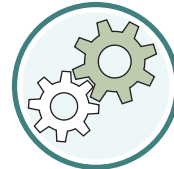
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Den internationella standarden ISO 81346-12:2018 gäller som svensk standard. Detta dokument innehåller den officiella engelska versionen av ISO 81346-12:2018.

The International Standard ISO 81346-12:2018 has the status of a Swedish Standard. This document contains the official English version of ISO 81346-12:2018.

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Har du synpunkter på innehållet i den här standarden, vill du delta i ett kommande revideringsarbete eller vara med och ta fram andra standarder inom området? Gå in på [www.sis.se](https://www.sis.se) - där hittar du mer information.

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## Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see [www.iso.org/directives](http://www.iso.org/directives)).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see [www.iso.org/patents](http://www.iso.org/patents)).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: [www.iso.org/iso/foreword.html](http://www.iso.org/iso/foreword.html).

This document was prepared by Technical Committee ISO/TC 10, *Technical product documentation*, Subcommittee SC 10, *Process plant documentation*, in cooperation with Technical Committee IEC/TC 3, *Information structures and elements, identification and marking principles, documentation and graphical symbols*.

Documents in the 80000 to 89999 range of reference numbers are developed by collaboration between ISO and IEC.

IEC 81346 consists of the following basic parts, under the general title *Industrial systems, installations and equipment and industrial products — Structuring principles and reference designations*:

- *Part 1: Basic rules*
- *Part 2: Classification of objects and codes for classes*

A list of all parts in the ISO 81346 series can be found on the ISO website.

## Introduction

This document considers and supports the planning, erection, utilization and operation of construction works. The application of a reference designation system for construction works (RDS-CW) may lead to restructuring and reorientation of these activities and thereby offers the potential for increasing efficiency and economization. The following advantages of designation systems will become increasingly important in the future.

- The reference designation system can be applied in several technical fields in the same way and is not designed only for one. So, technical, structural and constructive objects, for example, can be treated in the same way – a basis for company-wide synergy effects.
- The reference designation system allows for integrating any kind of systems and components without changing the once defined designations.
- The reference designation is not bound to a fixed structural pattern. Thus the designation system is vertically and horizontally expandable, which makes the interpretability in some cases quite complex. Therefore an exact and computer-interpretable documentation and description is essential.
- The application of different aspects allows for designation of system elements by function, realizing products or location independently of each other.
- The different aspects in structuring and the possibility of creating relations between objects represented in these structures offer search and filter criteria and information correlations in a much greater variety than before.

Users of this document will be able to manage object occurrences and related properties in a more efficient and consistent way. When implemented, information across various data processing systems can be handled in an unambiguous way. Other well-known information structures besides the reference designation structures in this document are:

- organization structures;
- utilization structures;
- cost structures;
- performance structures;
- real estate structures.

These and other structures can be linked to each other, or to the reference-designation-based structures, so that requirements of flexibility and individuality can be fulfilled.

New three-letter codes are used according to IEC 3/1224A/CD (IEC 81346-2:2009), Table 3.

# Industrial systems, installations and equipment and industrial products — Structuring principles and reference designations —

## Part 12: Construction works and building services

### 1 Scope

This document establishes rules for structuring of systems and the formulation of reference designations and provides classes for systems in the field of construction works and building services. This document also specifies a classification of objects and corresponding letter codes for use in reference designations of object occurrences.

This document is not intended for manufacturers or system-related designations of individuals (e.g. inventory number or serial number) or for product types (e.g. article number or parts number).

### 2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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.

ISO 4157-2:1998, *Construction drawings — Designation systems — Part 2: Room names and numbers*

ISO 15519-1, *Specification for diagrams for process industry — Part 1: General rules*

IEC 61082-1, *Preparation of Documents used in electrotechnology — Part 1: Rules*

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

IEC 81346-2:2009, *Industrial systems, installations and equipment and industrial products — Structuring principles and reference designations — Part 2: Classification of objects and codes for classes*

IEC 61175-1, *Industrial systems, installations and equipment and industrial products — Designation of signals*

IEC 61355-1:2008, *Classification and designation of documents for plants, systems and equipment — Part 1: Rules and classification tables*

IEC 61666, *Industrial systems, installations and equipment and industrial products — Identification of terminals within a system*

### 3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <http://www.electropedia.org/>

## SS-ISO 81346-12:2019 (E)

### 3.1

#### **aspect**

specified way of viewing an object

[SOURCE: IEC 81346-1:2009, 3.3]

### 3.2

#### **building**

construction works that has the provision of shelter for its occupants or contents as one of its main purposes, usually partially or totally enclosed and designed to stand permanently in one place

Note 1 to entry: A building is a type of construction entity.

[SOURCE: ISO 6707-1:2017, 3.1.1.3, modified — Note 1 to entry has been revised.]

### 3.3

#### **building services**

utilities and installations supplied and distributed within a building such as electricity, gas, heating, water and communications

[SOURCE: ISO 16484-2:2004, 3.33, modified — the abbreviated term “BS” has been deleted.]

### 3.4

#### **component**

product used as a constituent in an assembled product, system or plant

[SOURCE: IEC 81346-1:2009, 3.7]

### 3.5

#### **construction element**

constituent of a construction entity with a characteristic function, form, or position

Note 1 to entry: ISO 12006-2:2015, Table 1 classifies examples by function or form or position or any combination of these.

[SOURCE: ISO 12006-2:2015, 3.4.3, modified — Note 1 to entry revised.]

### 3.6

#### **construction entity**

independent unit of the built environment with a characteristic form and spatial structure, intended to serve at least one function or user activity

Note 1 to entry: A construction entity is the basic unit of the built environment. It is recognizable as a physically independent construction even though a number of construction entities might be seen as parts of a particular construction complex. Ancillary works such as access roads, landscaping or service connections may be regarded as part of a construction entity. Conversely, when ancillary works are of sufficient scale they may be regarded as construction entities in their own right.

[SOURCE: ISO 12006-2:2015, 3.4.2]

### 3.7

#### **construction works**

everything that is constructed or results from construction operations

Note 1 to entry: In ISO 12006-2:2015, the term “construction result” is used instead of the term “construction works”. Construction result is defined as “construction object which is formed or changed in state as the result of one or more construction processes using one or more construction resources.”

[SOURCE: ISO 6707-1:2017, 3.1.1.1, modified — Note 1 to entry has been added.]



### 3.8

#### **kind of document**

type of document defined with respect to its specified content of information and form of presentation

Note 1 to entry: Sometimes the term 'document type' is used for the same concept.

[SOURCE: IEC 61355-1:2008, 3.6]

### 3.9

#### **equipment**

aggregation of functional elements or assembly of components and modules that belong together in one physical unit of a plant or in a functional unit of a system

[SOURCE: ISO 16484-2:2004, 3.73]

### 3.10

#### **function**

intended or accomplished purpose or task

[SOURCE: IEC 81346-1:2009, 3.5]

### 3.11

#### **functional system**

object with characteristics which predominantly represents an overall inherent function

### 3.12

#### **inherent function**

function of an object, independent of any application of the object

Note 1 to entry: Oxford Dictionaries (<https://en.oxforddictionaries.com>) defines "inherent" as "existing in something as a permanent, essential, or characteristic attribute".

### 3.13

#### **object**

entity treated in a process of development, implementation, usage and disposal

Note 1 to entry: The object may refer to a physical or non-physical "thing", i.e. anything that might exist, exists or did exist.

Note 2 to entry: The object has information associated to it.

Note 3 to entry: Object is considered any part of the perceivable or conceivable world in ISO 12006-2:2015, 3.1.1.

[SOURCE: IEC 81346-1:2009, 3.1, modified — Note 3 to entry has been added.]

### 3.14

#### **plant**

assembly of different systems on a specific site

[SOURCE: IEC 61355-1:2008, 3.10]

### 3.15

#### **point of installation**

system on or in which components are installed

EXAMPLE Switch built into a wall system or built into a cabinet.

### 3.16

#### **product**

intended or accomplished result of labour, or of a natural or artificial process

[SOURCE: IEC 81346-1:2009, 3.6]

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### 3.17

#### **site of installation**

space in which systems or components are physically located

EXAMPLE Cabinet located in a technical room.

### 3.18

#### **space**

limited three-dimensional extent defined physically or notionally

[SOURCE: ISO 12006-2:2015, 3.1.8]

### 3.19

#### **structure**

organization of relations among objects of a system describing constituency relations (consist-of/is-a-part-of)

[SOURCE: IEC 81346-1:2009, 3.9]

### 3.20

#### **system**

set of interrelated objects considered in a defined context as a whole and separated from their environment

Note 1 to entry: A system is generally defined with the view of achieving a given objective, e.g. by performing a definite function.

Note 2 to entry: 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 organization, mathematical methods, programming languages).

Note 3 to entry: 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 to entry: When a system is part of another system, it may be considered as an object as defined in this document.

[SOURCE: IEC 81346-1:2009, 3.2, modified — Note 4 deleted and Note 5 renumbered.]

### 3.21

#### **technical system**

object with characteristics which predominantly represents a coherent technical solution with an inherent function

## 4 Structuring

### 4.1 General

To administer a (technical) system and its information in the various life cycle phases (e.g. basic data collection, planning, construction, operation, dismantling and disposal), it is necessary to divide the system into several (sub)systems (objects) – that is to structure it. The structuring is performed stepwise, either in a top-down or bottom-up manner, resulting in a tree-like structure (see also IEC 81346-1:2009, 5.1 and 5.2).

The process of structuring is carried out according to the following aspects:

- the function aspect – what an object is intended to do or what it actually does;
- the product aspect – by which means an object does what it is intended to do;
- the location aspect – intended or actual space of the object;
- the type aspect – to which group with identical properties an object belongs.

Because of the different information contents, a separate structure for each aspect may be needed – especially if the application of aspects should be consequent.

By building relations between the above named structures, characteristic information can be assembled and task-related conclusions on an object stated, such as information about the location of the object or a product that implements two different functions.

To differentiate between the different aspects, the following prefixes shall be used according to IEC 81346-1:

- “=” (equal) when relating to the function aspect;
- “-” (minus) when relating to the product aspect;
- “+” (plus) when relating to the location aspect;
- “%” (percent) when relating to the type aspect.

## 4.2 Function-oriented structure

The function-oriented consideration is important for the full life cycle of a system, for example system design, design of process and control functions, commissioning and also for locating failures of function, service operations and optimization works during system operation.

The function-oriented structure is based on the purpose of a system and helps to understand and to structure any system without taking the physical solution or location of the object into consideration. The functional reference designation (=) can be shown in any kind of document, but is typically applied in schematic and non-scaled documents, for example overview diagram, process diagram, function diagram, and circuit diagram.

## 4.3 Product-oriented structure

The product-oriented structure describes how a system is implemented and assembled. The structure shows the partitioning of a system into single objects with regard to the product aspect independently of where the product is located and which function it fulfils.

In the context of the product aspect, terms of tangible products include plant complex, plant, technical equipment, component, wall, column and slab.

A product can realize one or more functions, for example a heat exchanger can heat or cool, and an ornament can be used for covering and for providing a presentation of some artwork. Several control functions can be implemented in one control system unit.

A product can, alone or together with others, be located at one or more locations, for example a measuring system with location of measuring unit and displaying unit or a duct system extended to several different locations.

With regard to the structuring and assessment of objects in planning and implementation as preparation of the operation phase, the product-oriented aspect is important, for example for assembling and maintenance.

The product reference designation (-) can be shown in any kind of document, but is typically applied in scaled documents and descriptions, for example product description, construction drawing assembly drawing, explosion drawing, network part drawing and maintenance instruction.

In the building industry a further distinction is made between construction products (e.g. ceilings, walls or columns) and products of the building services (e.g. filters, pumps, chillers or boilers).