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**Technical product documentation —  
Vocabulary — Terms relating to  
technical drawings, product definition  
and related documentation**

*Documentation technique de produits — Vocabulaire — Termes  
relatifs aux dessins techniques, à la définition de produits et à la  
documentation associée*

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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 of 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 [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*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/SS F01, *Technical drawings*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This second edition cancels and replaces the first edition (ISO 10209:2012), which has been technically revised.

The main changes are as follows:

- certain terms have been added, deleted or revised;
- Annex A (deprecated terms) has been deleted.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at [www.iso.org/members.html](http://www.iso.org/members.html).

# Technical product documentation — Vocabulary — Terms relating to technical drawings, product definition and related documentation

## 1 Scope

This document establishes and defines terms used in technical product documentation relating to technical drawings, product definition and related documentation in all fields of application.

The terms have been classified into specific fields of application.

NOTE New terms required by ISO/TC 10 subcommittees and working groups for new or revised standards will be ratified by the ISO/TC 10 vocabulary maintenance team and included in future amendments of this document.

## 2 Normative references

There are no normative references in this document.

## 3 Terms and definitions

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

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

### 3.1 General terms

#### 3.1.1 activity

processes, procedures or parts of them, usually related to established organization units

Note 1 to entry: The terms “process” and “procedure” are defined in ISO 9000. A detailed explanation of processes within companies is also given in ISO 9000.

#### 3.1.2 activity matrix

matrix allocating activities to phases of the product life cycle and to a fixed organization unit

#### 3.1.3 analysis

part of the product development process where a specification of requirements is prepared

#### 3.1.4 ancillary system

system which is not directly required for the power plant process

Note 1 to entry: This includes heating, ventilation, air-conditioning systems, space heating systems, stationary compressed air supplies, fire protection systems, cranes, elevators, workshops and staff amenities.

### 3.1.5

#### **application reference model**

information model that formally describes the information requirements and constraints for an application area

### 3.1.6

#### **aspect**

<document management> specific way of selecting information on, or describing, a system or an object of a system

### 3.1.7

#### **aspect**

<industrial systems> specific way of viewing an object

Note 1 to entry: Such ways include:

- what the system or object is doing (function viewpoint);
- how the system or object is constructed (product viewpoint);
- where the system or object is located (location viewpoint).

### 3.1.8

#### **assembly**

number of component parts fitted together to perform a specific function

### 3.1.9

#### **authorization**

<of a user> privileges that give access to designated activities

### 3.1.10

#### **auxiliary system**

system which is required for the support of a power plant process

Note 1 to entry: This includes auxiliary steam system, compressed air, carrier air, control air, central chemicals supply and sampling systems.

### 3.1.11

#### **basic design**

part of the product development process where one or more design proposals are evaluated and the basic documentation for design is prepared

### 3.1.12

#### **burr**

rough remainder of material outside the ideal geometrical shape of an external edge, residue of machining or forming process

### 3.1.13

#### **CAD model**

structured computer-aided design (CAD) data file(s) organized according to the physical parts of the objects represented, for example a building or a mechanical device

Note 1 to entry: Models can be two-dimensional or three-dimensional and can include graphical as well as non-graphical data attached to the objects.

### 3.1.14

#### **complex device**

device consisting of several functionally interrelated components or elements, the description of which needs a diagram

**3.1.15****component**

constituent part of equipment that cannot be physically divided into smaller parts without losing its character

**3.1.16****conceptual design**

part of the product development process which includes the preparation of design specifications and design proposals for a product

**3.1.17****conceptual schema**

implementation-independent specification of information structures

**3.1.18****concurrent engineering**

coordination of parallel activities in the product life cycle, especially in the phases up to market introduction

**3.1.19****configuration control**

activities comprising the control of changes to a configuration item after formal establishment of its configuration documents

**3.1.20****conjoint designation**

designation of site, factory or plant complex as an optional element of the object identifier

**3.1.21****construct**

concept or fact that is modelled

**3.1.22****coordinate axis**

three reference straight lines in space which intersect at the point of origin, thus forming a coordinate system

**3.1.23****coordinate system**

basis for establishing a relationship between each point in space and the three corresponding coordinates and vice versa

**3.1.24****coordinates**

set of numerical ordered values (and their corresponding units of measure), giving unequivocally the position of a point in a coordinate system

**3.1.25****cylindrical coordinate system**

coordinate system based on a reference system given by a reference horizontally oriented straight line and its origin and units of measure

**3.1.26****cylindrical coordinates**

three coordinates of a point in space relative to a cylindrical coordinate system

Note 1 to entry: The three coordinates are: 1) the radius (distance of the point from the vertical axis passing through the origin); 2) the azimuth (angle formed by the vertical plane passing through the point and the origin and the reference horizontally oriented straight line); and 3) the height (distance of the point from the horizontal plane passing through the origin).

**3.1.27**

**data medium**

material on which data can be recorded and from which they can be retrieved

**3.1.28**

**detailed design**

part of the product development process which includes the preparation of the final product definition

**3.1.29**

**device**

assembly of components to perform a required function

**3.1.30**

**edge**

intersection of two surfaces

**3.1.31**

**element**

part of a component

**3.1.32**

**enlargement scale**

scale where the ratio is larger than 1:1

**3.1.33**

**equipment**

<chemical and petrochemical industry> single part of a plant

EXAMPLE Vessel, column, heat exchanger, pump, compressor.

**3.1.34**

**full size**

scale with the ratio 1:1

**3.1.35**

**function**

<power plants> activity proper to anything, mode of action by which it fulfils its purpose

**3.1.36**

**function**

<industrial systems> intended or accomplished purpose or task

**3.1.37**

**functional area**

combination of groups and/or elements in a unit that can be used independently

**3.1.38**

**functional group**

combination of elements in a unit that can be used independently

**3.1.39**

**functional unit**

<graphical symbols> constructional assembly containing functionally interrelated components or devices

**3.1.40**

**functional unit**

<power plants> item under consideration defined according to function or effect

**3.1.41**

**identifier**

one or more characters used to identify or name a data category



**3.1.42****industrial complex**

number of discrete or interconnected process plants, together with the associated buildings

**3.1.43****information model**

<metadata> conceptual model that describes a specific organization of data to provide communication for a given application context

**3.1.44****information model**

<document management> implementation-independent specification of information structures

**3.1.45****layer**

<graphical symbols> self-contained group of data that can be manipulated or displayed individually

**3.1.46****layer**

<computer-aided design> organizational attribute of entities in a computer-aided design (CAD) data file, used to separate data in order to manage and communicate those data and to control visibility on the computer screen and on plotted drawings

Note 1 to entry: In CAD systems, synonyms for layer are used, for example “level”.

**3.1.47****line distance factor**

factor defining the distance between succeeding base lines of a text in relation to the lettering height of the characters

**3.1.48****medium**

means of storing, representing and communicating information

**3.1.49****multi-level reference designation**

<process industry> reference designation derived from a structure path through an overall system

**3.1.50****multi-level reference designation**

<industrial systems> reference designation consisting of concatenated single-level reference designations

**3.1.51****object**

<document management> entity treated in the process of design, engineering, realization, operation, maintenance and demolition

**3.1.52****object**

<industrial systems> 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 that possibly exists, exists or did exist.

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

**3.1.53****organization unit**

part of an organization, with a fixed function

**3.1.54**

**part number**

unique identification of a part for a particular organization

**3.1.55**

**part reference**

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

Note 1 to entry: Part references are document-based, as opposed to reference designations, which are structure-based. Identical parts on drawings have the same part reference, normally a number (according to ISO 6433), while each occurrence of an object in a structure has a unique reference designation (according to IEC 81346-1).

**3.1.56**

**physical unit**

item under consideration, defined according to construction or configuration

Note 1 to entry: One or several functional units may be implemented in a single physical unit. The corresponding functional unit(s) is/are in some cases not explicitly designated.

Note 2 to entry: The various parts of a physical unit need not be functionally interrelated. For example, a physical unit may be in the form of an integrated circuit with four independent AND modules.

Note 3 to entry: If compound terms are used to designate physical units, the following should be used as the last word (in ascending order of rank):

- component;
- assembly;
- device;
- plant.

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Note 4 to entry: See IEC 60050-351:2013, 351-56-03.  
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**3.1.57**

**plant**

complete set of technical equipment and facilities for solving a defined technical task

Note 1 to entry: A plant includes apparatus, machines, instruments, devices, means of transportation, control equipment and other operating equipment.

**3.1.58**

**plant section**

part of a process plant that can, at least occasionally, be operated independently

**3.1.59**

**polar coordinate axis**

horizontally oriented straight line and its origin

**3.1.60**

**polar coordinate system**

coordinate system based on a reference system given by a polar coordinate axis and its units of measure

**3.1.61**

**polar coordinates**

three coordinates of a point in space relative to a polar coordinate system

Note 1 to entry: The three coordinates are: 1) the radius (distance between the point and the origin); 2) the azimuth (angle formed by the vertical plane passing through the point and the origin, and the polar coordinate axis); and 3) the angular height (angle formed by the horizontal plane passing through the origin and the straight line passing through the point and the origin).

**3.1.62****process**

<process plants and industry> sequence of chemical, physical or biological operations for the conversion, transport or storage of material or energy

Note 1 to entry: Different processes or process steps can be carried out in the same process plant or plant section at different times.

Note 2 to entry: A process can also be regarded as an entirety of interacting events in a system through which material, energy or information are transformed, transported or stored.

**3.1.63****process**

<industrial systems> set of interacting operations by which material, energy or information is transformed, transported or stored

**3.1.64****process plant**

facilities and structures necessary for performing a process

**3.1.65****process step**

part of a process which is predominantly self-sufficient and consists of one or several unit operations

**3.1.66****product**

<document management> intended or accomplished result of labour or of a natural or artificial process

**3.1.67****product**

<protection notices> thing or substance produced by a natural or artificial process

**3.1.68****product**

<graphical symbols> thing or result produced by a natural process or manufacture

**3.1.69****product definition data**

data elements required to completely define a product

**3.1.70****product definition data set**

collection of one or more computer file(s) that discloses (directly or by reference), by means of graphic or textual presentations, or combinations of both, the physical and functional requirements of a product

**3.1.71****rectangular coordinate planes**

coordinate planes intersecting at right angles

**3.1.72****rectangular coordinate system**

coordinate system based on a reference system given by three mutually orthogonal axes (rectangular coordinate axes), originating from the same point (origin), and their units of measure

**3.1.73****rectangular coordinates**

x, y and z coordinates of a point in space relative to a rectangular coordinate system

**3.1.74****rectangular coordinate axes**

coordinate axes intersecting at right angles

**3.1.75**

**reference designation**

<process industry> 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

**3.1.76**

**reference designation**

<process plants> code for identification of equipment in the functional position of the process

**3.1.77**

**reference designation set**

collection of two or more reference designations assigned to an object of which at least one unambiguously identifies this object

**3.1.78**

**scale**

ratio of the linear dimension of an element of an object as represented in the original drawing to the real linear dimension of the same element of the object itself

Note 1 to entry: The scale of a print may be different from that of the original drawing.

**3.1.79**

**scaling factor**

factor by which the coordinates of all defined points of the symbol will be enlarged or reduced in size in relation to the reference point of the symbol

**3.1.80**

**sharp edge**

external or internal edge of part with almost zero deviation from the ideal geometrical shape

**3.1.81**

**single-level reference designation**

reference designation assigned with respect to the object of which the specific object is a direct constituent in one aspect

**3.1.82**

**specification of requirements**

compilation of market-, authority- and company-related requirements

Note 1 to entry: 'Authority' relates to, for example, laws, regulations and directives.

**3.1.83**

**state of an edge**

geometrical shape and size of an edge

**3.1.84**

**structure**

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

**3.1.85**

**sub-contract**

contract to carry out part of a larger contract

**3.1.86**

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

### **3.1.87**

#### **tender**

written offer to execute at a stated price or rate an order for the supply of goods or services or the execution of works under given conditions

### **3.1.88**

#### **terminal designation**

identifier of a terminal with respect to the object to which it belongs, related to one aspect of the object

### **3.1.89**

#### **unit operation**

simplest operation in a process according to the theory of process technology

### **3.1.90**

#### **works**

system of industrial complexes and the associated infrastructure in one location

### **3.1.91**

#### **knurling tool**

knurl

tool or die used to make a raised surface on a workpiece by a cutting or rolling process

### **3.1.92**

#### **knurling**

patterned raised surface on a workpiece produced by a knurl

### **3.1.93**

#### **diametral pitch**

**P**

radial distance between two teeth measured on the outer diameter of the knurling

### **3.1.94**

#### **building**

construction work that has the provision of shelter for its occupants or contents as one of its main purposes, and which is 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.

### **3.1.95**

#### **control**

purposeful action on or in a process to meet specified objectives

Note 1 to entry: Actions include measure, count, monitor, indicate, alert, record, log, manipulate, evaluate, optimize, intervene, manipulate by hand, safeguard, structure, configure, parameter, automate.

### **3.1.96**

#### **designation block**

structured compilation of related information units, consisting of a prefix, letters and numbers, and optionally a breakdown mark

**3.1.97**

**operating equipment**

products which serve to implement technical tasks as a whole or in individual parts

**3.1.98**

**power plant process**

process for the generation of electrical energy and/or heat energy products, including the conversion, supply and disposal processes

**3.1.99**

**power plant unit**

technical plant including all equipment needed for fulfilment of a power plant process

**3.1.100**

**technical equipment**

physical or functional unit used to fulfil a technical task

**3.1.101**

**actuator**

functional unit that generates from the controller output variable the manipulated variable to drive the final controlling element

Note 1 to entry: If the final controlling element is mechanically actuated, it is controlled via an actuated drive. The actuator drives the actuating drive in this case.

**3.1.102**

**closed-loop control**

process whereby one variable (quantity), namely the controlled variable, is continuously measured compared with another variable (quantity), namely the reference variable, and influenced in such a manner as to adjust to the reference variable

Note 1 to entry: A characteristic of closed-loop control is the closed action in which the controlled variable continuously influences itself in the action path of the closed loop.

**3.1.103**

**control function**

manipulation via the final controlling element of process media or process objects in order to bring the media or object into a condition or state defined by the process control system on the basis of measured process variables and predefined values

**3.1.104**

**control loop**

assembly of elements incorporated in the closed action of a closed-loop control

**3.1.105**

**final controlling element**

functional unit forming part of the controlled system and arranged at its input, driven by the manipulated variable and manipulating the mass flow or energy flow

Note 1 to entry: If the final controlling element is mechanically actuated, an additional actuator (positioner) is used in some cases.

Note 2 to entry: The output variable of the final controlling equipment is usually not free from feedback. The interface between the actuator and the final controlling element should therefore be selected in such a way that the manipulated variable is not affected by feedback from the final controlling element.

**3.1.106**

**manipulate**

change flows of mass energy or information by means of a final controlling element

Note 1 to entry: Manipulating can be affected continuously or by switching operations.

Note 2 to entry: In control engineering, the final controlling element is regarded as belonging to a process.

### 3.1.107

#### **open-loop control**

process in a system whereby one or more variables (variable quantities) as input variables influence other variables (variable quantities) as output variables in accordance with the proper laws of the system

Note 1 to entry: A characteristic of open-loop control is the open action path or, in the case of a closed action path, the fact that the output variables being influenced by the input variables are not continuously influencing themselves and not by the same input variables.

### 3.1.108

#### **process variable**

quantity, quality or condition of a process media or process object whose value may be subject to change and can usually be measured

### 3.1.109

#### **relief groove**

clearance groove of specified form and dimensions created by removing material at an inner corner of a rotationally symmetric workpiece and which is necessary for subsequent machining and assembly with mating parts

### 3.1.110

#### **developed length**

initial length of material prior to forming, for example by bending

## 3.2 Views

### 3.2.1

#### **alignment line**

line parallel to a given line passing through the projection centre

Note 1 to entry: Its intersection with the projection plane gives the vanishing point of all lines parallel to the given line.

### 3.2.2

#### **aspect**

<views> specified way of viewing an object

### 3.2.3

#### **axonometric representation**

parallel projection of an object on a single projection plane

### 3.2.4

#### **basic line**

intersection between the projection plane and the basic plane

### 3.2.5

#### **basic plane**

horizontal plane parallel to the main projection line on which the viewer stands

Note 1 to entry: The viewer is considered to only use one single viewpoint.

### 3.2.6

#### **bird's-eye perspective**

one-point perspective, seen from above, on a horizontal projection plane