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Technical product documentation — Indication of dimensions and tolerances —

Part 2:
Dimensioning of mechanical engineering drawings

Documentation technique de produits — Indication des cotes et tolérances —

Partie 2: Cotations dans le domaine de la construction mécanique

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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.

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The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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.

ISO 129-2 was prepared by Technical Committee ISO/TC 10, *Technical product documentation*.

ISO 129 consists of the following parts, under the general title Technical product documentation — Indication of dimensions and tolerances:

— *Part 1: General principles*

— *Part 2: Dimensioning on mechanical engineering drawings*

— *Part 4: Dimensioning of shipbuilding drawings*

— *Part 5: Dimensioning of steel structures*

— *Part 6: Simplified dimensioning for mechanical engineering drawings*

Introduction

ISO 129-2 is intended for the dimensioning of technical drawings in the field of mechanical engineering.

The general rules and applications which are valid for all technical fields are covered by part 1 of this standard.

Figures in this part of ISO 129 illustrate the rules and are not intended to show complete representations. It should be understood that the third angle projection could equally well have been used without prejudice to the principles established.

The principles of tolerancing and interpretation of tolerance indications are given in the ISO 14405 series.

Technical product documentation — Indication of dimensions and tolerances — Part 2: Dimensioning on mechanical engineering drawings

1 Scope

This part of ISO 129 establishes the specific rules and details about the use of dimensioning for technical drawings in the field of mechanical engineering.

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.

ISO 128-20:1996, *Technical drawings -- General principles of presentation -- Part 20: Basic conventions for lines*

ISO 128-24:1999, *Technical drawings -- General principles of presentation -- Part 24: Lines on mechanical engineering drawings*

ISO 128-50:2001, *Technical drawings — General principles of presentation — Part 50: Basic conventions for representing areas on cuts and sections*

ISO 129-1:2004, *Technical drawings -- Indication of dimensions and tolerances -- Part 1: General principles*

3 Terms and definitions

For the purposes of this part of ISO 129, the terms and definitions of ISO 129-1 and the following apply.

3.1
dimension
distance between two features or the size of a feature of size

[ISO 10209:2012]

NOTE Linear and angular dimensions exist.

3.2
auxiliary dimension
dimensions derived from other dimensions given for information purposes only

[ISO 10209:2012]

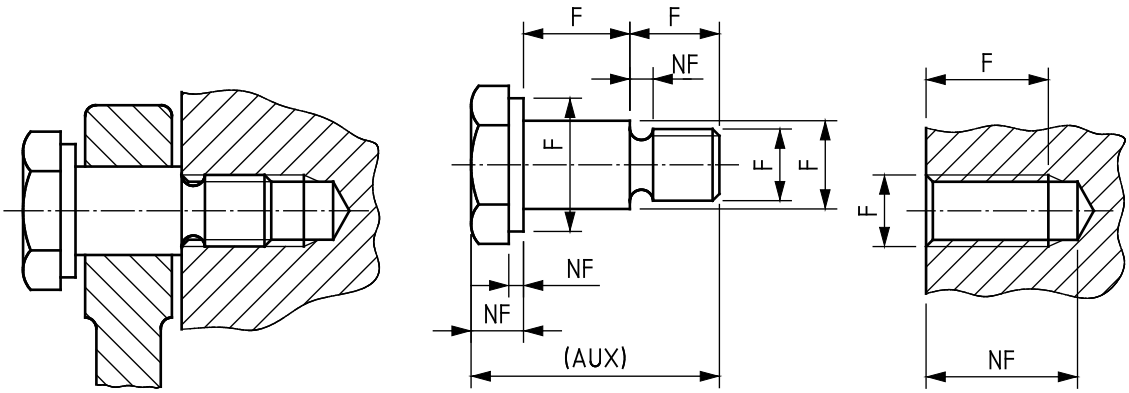
NOTE Auxiliary dimensions do not govern production or inspection operations. Auxiliary dimensions are indicated in parentheses without any tolerance indications, see ISO 129-1 clause 7. See “(AUX)” in Figure 1.

3.3
functional dimension
dimension that is essential to the function of the workpiece or space in an assembly

NOTE See “F” in Figure 1.

3.4
non-functional dimension
dimension that is not essential to the function of the workpiece or space in an assembly.

NOTE Non-functional dimensions can be essential in the manufacture of a workpiece. See “NF” in Figure 1.



a) Design requirement **b) Shoulder screw** **c) Threaded hole**

Figure 1 — Functional, non-functional and auxiliary dimensions

4 Principles of dimensioning

4.1 General principles

The dimensions that are necessary to define the features of the represented object shall be indicated on a drawing.

The dimensions that define the features of the represented object shall be chosen according to functional and production needs.

No feature of a represented object shall be defined by more than one dimension in any direction. Exceptions may, however be made where the addition of an auxiliary dimension would be advantageous.

Unless otherwise specified, dimensions shall be indicated for the finished state of the dimensioned feature.

If it is necessary to give additional dimensions at intermediate stages of production (e.g. the size of a feature prior to carburizing and finishing) they shall be indicated in square parentheses (see Figures 18 and 19).

4.2 Functional dimensioning

Functional dimensioning is characterized by the selection, indication and tolerancing of dimensions being defined exclusively according to design criteria and to fulfil the intended function.

Functional dimensions shall be indicated directly on the drawing wherever possible (see Figure 2).

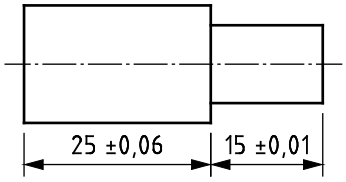


Figure 2

When the dimensions are changed from the functional requirements for the purposes of production, care shall be taken that the original functional requirements are still met.

5 Elements of dimensioning

5.1 General

The elements of dimensioning are defined in Part 1 of this standard

Exceptions and extensions which are specific to mechanical engineering drawings are defined in the following clauses.

5.2 Terminators and origin indication

5.2.1 Terminators

From the possibilities of terminators of a dimension line according to Part 1 of this standard only the following are used in the field of mechanical engineering (see Figure 3).

a) closed 30° **b) open 30°**

c) oblique stroke between arrows **d) point between arrows**

Figure 3

5.2.2 Origin indication

The symbol “origin indication” according to ISO 129-1 may be used for additional indications.