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International Standard



8015

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## Technical drawings — Fundamental tolerancing principle

*Dessins techniques — Principe de tolérancement de base*

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## Foreword

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Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council. They are approved in accordance with ISO procedures requiring at least 75 % approval by the member bodies voting.

International Standard ISO 8015 was prepared by Technical Committee ISO/TC 10, *Technical drawings*.

Users should note that all International Standards undergo revision from time to time and that any reference made herein to any other International Standard implies its latest edition, unless otherwise stated.

# Technical drawings — Fundamental tolerancing principle

## 1 Scope

This International Standard specifies the principle of the relationship between dimensional (linear and angular) tolerances and geometrical tolerances.

## 2 Field of application

The specified principle shall be applied on technical drawings and related technical documents to

- linear dimensions and their tolerances;
- angular dimensions and their tolerances;
- geometrical tolerances;

which define the following four aspects for each feature of the part:

- size;
- form;
- orientation;
- location.

## 3 References

ISO 286/1, *ISO system of limits and fits — Part 1: Bases of tolerances, deviations and fits.*<sup>1)</sup>

ISO 1101, *Technical drawings — Geometrical tolerancing — Tolerancing of form, orientation, location and run-out — Generalities, definitions, symbols, indications on drawings.*

ISO 2692, *Technical drawings — Geometrical tolerancing — Maximum material principle.*<sup>2)</sup>

## 4 Principle of independency

Each specified dimensional or geometrical requirement on a drawing shall be met independently, unless a particular relationship is specified.

Therefore, where no relationship is specified, the geometrical tolerance applies regardless of feature size, and the two requirements are treated as being unrelated.

Consequently, if a particular relationship of

- size and form, or
- size and orientation, or
- size and location

is required, it shall be specified on the drawing (see clause 6).

## 5 Tolerances

### 5.1 Dimensional tolerances

#### 5.1.1 Linear tolerances

A linear tolerance controls only the actual local sizes (two-point measurements) of a feature, but not its form deviations (for example circularity and straightness deviations of a cylindrical feature or flatness deviations of two parallel plane surfaces). (See ISO 286/1.)

Form deviations shall, however, be controlled by the following:

- individually indicated form tolerances;
- general geometrical tolerances;
- envelope requirement.

NOTE — For the purposes of this International Standard, a single feature consists of a cylindrical surface or two parallel plane surfaces.

There is no control of the geometrical interrelationship of individual features by the linear tolerances. For example, the perpendicularity of the sides of a cube is not controlled and, therefore, it requires a perpendicularity tolerance dictated by the design requirement.

1) At present at the stage of draft. (Revision of ISO/R 286-1962.)

2) At present at the stage of draft. (Revision of ISO 1101/2-1974.)