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Building construction — Tolerances — Expression of dimensional accuracy — Principles and terminology

*Construction immobilière — Tolérances — Expression de l'exactitude
dimensionnelle — Principes et terminologie*

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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.

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.

International Standard ISO 1803 was prepared by Technical Committee ISO/TC 59, *Building construction*, Subcommittee SC 4, *Dimensional tolerances and measurement*.

It cancels and replaces ISO 1803-1:1985, ISO 1803-2:1986 and ISO 4464:1980.

In this edition the expression of dimensional accuracy is built up round the concept of target size. A list of basic terms, their definitions, and a list of terms relating to dimensional variability, together with their definitions, is included.

Annexes A and B of this International Standard are for information only.

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Building construction — Tolerances — Expression of dimensional accuracy — Principles and terminology

1 Scope

This International Standard describes the basic principles for the expression of dimensional deviation in building, and defines the basic terms and definitions relating to the evaluation, specification and verification of accuracy.

It is applicable to the manufacture of building components (standard or purpose made), the setting out process, erection and assembly, and the building as a whole.

Annex A gives equivalent terms in French and German. Annex B lists International Standards related to dimensions and dimensional accuracy in building.

2 General principles

The process of building construction causes specific problems in the field of the achievement of accuracy and fit which require detailed examination in relation to techniques of construction, performance and aesthetic requirements, as well as the cost of erection of the building, its intended use and the possible replacement of components during its lifetime. The construction under site conditions of a large-scale object such as a building, involving the assembly of dimensionally variable components by means of a sequence of measuring and positioning operations, can result in deviations from the designed size and shape (induced deviations). Coupled with this are the inevitable dimensional changes resulting from movements and change of size of materials in response to changes in ambient, loading and other conditions (inherent deviations).

This international Standard forms part of a coordinated set of standards by means of which

- a) the expected dimensional variability may be both assessed and allowed for in design (using the probability concept if desired);
- b) the dimensional needs of joints can be compared with expected variabilities so that functionally satisfactory joints can be achieved;
- c) the accuracy requirements, which reflect the needs of the design, may be clearly specified for all stages of construction;

d) the sizes and shapes of components, in *in-situ* work and buildings, may be subjected to the necessary dimensional checks and compliance control procedures during manufacture, setting out and erection.

In practice, dimensional variability exists in any process of fabrication or measurement. Inaccuracies will occur at each of the stages in the building process, resulting in deviations (manufacturing deviation, setting-out deviation and erection deviation) from the desired size (target size); see figure 1. Thus, for the actual performance of a building to match the desired or target performance, the design should take account of dimensional variability using the probability concept, where appropriate. The functional requirements of the design set limits on variability (permitted deviations) in relation to which the achieved dimensions should be checked for compliance; see figure 2. Compliance procedures are not only carried out at the end of the process (which in many cases would be too late to rectify errors), but at each stage in the process of manufacture, setting out and erection.

The size of the building and its components will vary with physical conditions such as temperature and humidity. It may be necessary to specify the physical reference conditions, the time and the required measuring accuracy at which target sizes and their permitted deviations apply.

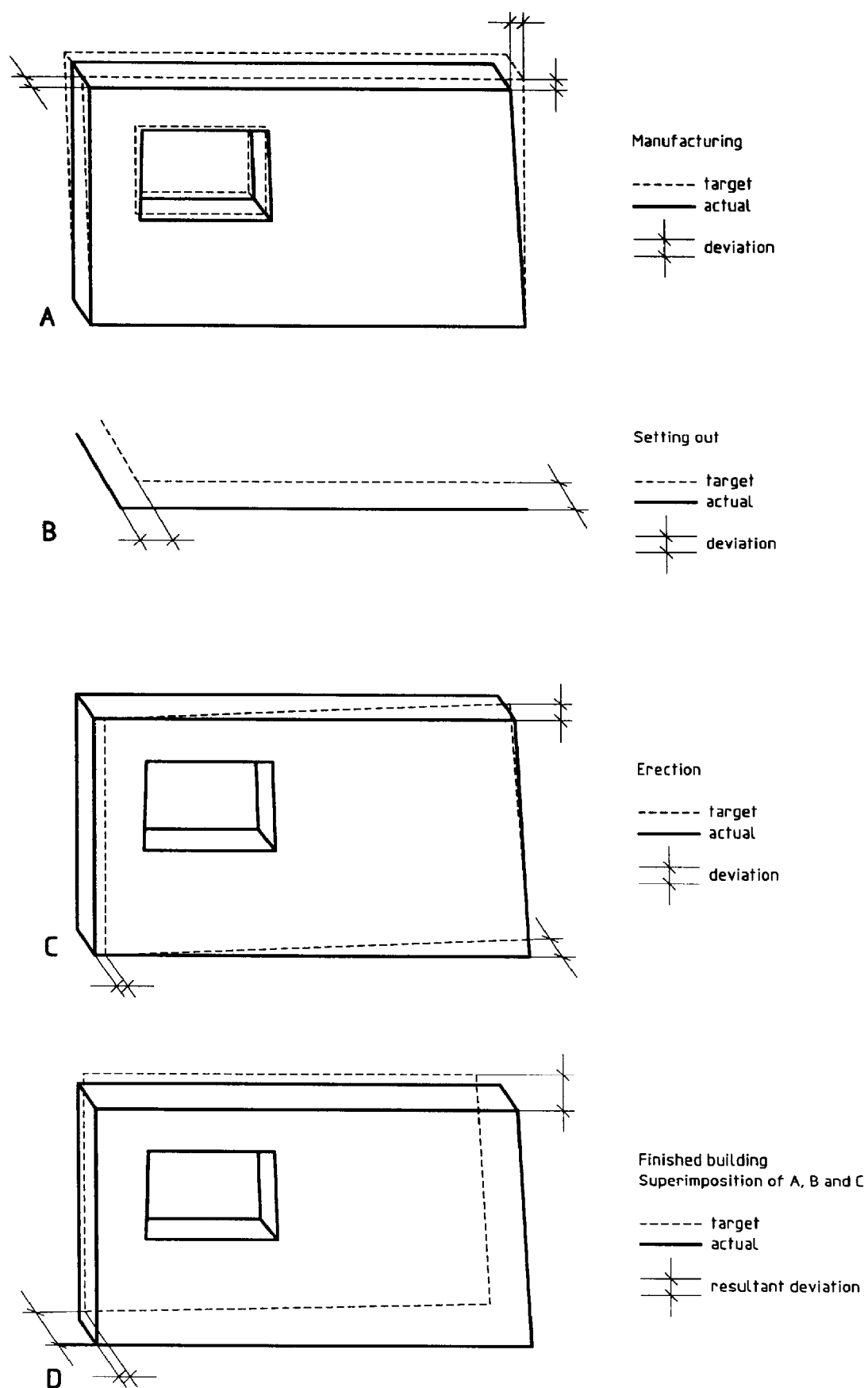


Figure 1 — Illustration of deviations in manufacturing, setting out and erection, combining to form the resultant deviation in the finished building