BS 6954 : Part 3 : 1988
ISO 3443/3-1987
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British Standard

Tolerances for building

Part 3. Recommendations for selecting target size and predicting fit

Tolérances pour le bâtiment
Partie 3. Choix de dimensions-cibles et prévision des possibilités d'assemblage — Recommandations

Toleranzen im Bauwesen
Teil 3. Empfehlungen zur Festlegung von Sollmaßen und zur Vorausberechnung von Passungen

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National foreword

This Part of BS 6954 has been prepared under the direction of the Basic Data and Performance Criteria for Civil Engineering and Building Structures Standards Committee. This Part of BS 6954 together with Parts 1 and 2 form a revision of DD 22 : 1972. BS 6954 : Parts 1, 2 and 3 supersede DD 22 : 1972, which is withdrawn. This Part of BS 6954 is identical with ISO 3443/3-1987 'Tolerances for building — Part 3 : Procedures for selecting target size and predicting fit', published by the International Organization for Standardization (ISO).

BS 6954 comprises three Parts as follows:

Part 1 Recommendations for basic principles for evaluation and specification

Part 2 Recommendations for statistical basis for predicting fit between components having a normal distribution of sizes

Part 3 Recommendations for selecting target size and predicting fit

BS 6954 enables the nature of deviations from intended sizes to be taken into account when designing to achieve satisfactory fit. This Part of BS 6954 enables a building designer, a component manufacturer or a builder to assess the probability of satisfactory fit of components and joints.

In figure 1 the symbol C_{sp} refers to the coordinating size of a space which is to accept one or more components.

This Part of BS 6954 provides a calculation method to be used with the characteristic accuracy data given in terms of mean and standard deviations shown in BS 5606*.

Reference is made in the introduction to ISO 3443/4, which provides an alternative calculation procedure and has not been adopted by the UK; this Part of BS 6954 is considered to be preferable and can be used without reference to ISO 3443/4.

Terminology and conventions. The text of the international standard has been approved as suitable for publication as a British Standard without deviation. Some terminology and certain conventions are not identical with those used in British Standards; attention is drawn especially to the following.

The comma has been used as a decimal marker. In British Standards it is current practice to use a full point on the baseline as the decimal marker. Wherever the words 'International Standard' appear, referring to this standard, they should be read as 'British Standard'.

Cross-references

International standard	Corresponding British Standard
ISO 1791-1983	BS 6100 Glossary of building and civil engineering terms Subsection 1.5.1 : 1984 : Coordination of dimensions; tolerances and accuracy (Technically equivalent)
ISO 3443/1-1979	BS 6954 Tolerances for building Part 1 : 1988 Recommendations for basic principles for evaluation and specification (Identical)
ISO 3443/2-1979	Part 2 : 1988 Recommendations for statistical basis for predicting fit between components having a normal distribution of sizes (Identical)

The Technical Committee has reviewed the provisions of ISO 1803/1 and ISO 1803/2, to which reference is made in the text, and has decided that they are acceptable for use in conjunction with this standard. A related standard to ISO 1803/1 : 1985 is BS 6100 'Glossary of building and civil engineering terms' Subsection 1.5.1 : 1984 'Coordination of dimensions; tolerances and accuracy'.

See also paragraph six of the national foreword.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

*BS 5606 : 1978 'Code of practice for accuracy in building' (under revision)

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Tolerances for building

Part 3. Recommendations for selecting target size and predicting fit

0 Introduction

This part of ISO 3443 forms one of a series concerning tolerances for building and building components.

It should be read in conjunction with parts 1 and 2 of ISO 3443, ISO 1803-1 and ISO 1803-2.

Parts 3 and 4 of ISO 3443 have been produced to meet the needs for internationally agreed methods of relating accuracy, tolerances and fit in the determination of sizes for components and construction (and, in part 4, joints). Two distinct needs are identified, though both share common ground.

There is thus a need to provide generally applicable expressions relating accuracy, tolerances and fit, that can be drawn upon either

a) to identify optimum target sizes for standard components where each type of component has a variety of applications, or

b) to identify appropriate limits of size for components, whether standard or not, for application in a specific building.

Both needs can be met by expression of substantially the same relationships between the factors affecting fit, and in principle either part might be pressed into service to meet either aim. In practice, however, each is structured to serve its particular purpose.

Joints in more than one dimension are however only considered in part 4 of ISO 3443.

This part of ISO 3443 is structured primarily to meet the aims in a) above. It provides procedures for selecting target sizes (formerly "work sizes") for components or *in situ* parts, such that joint clearances will be within their required limits with a known probability of success.[1)] The procedures deal with the relationship between the following factors:

1) accuracy of components and *in situ* work;

2) sizes of components and *in situ* work;

3) joint clearances;

4) probability of fit;

and they can be used whether 2), 3) or 4) above is the unknown to be calculated. The procedures assume that values for 1) above have been established by measurement surveys and relate target sizes to coordinating sizes using the concepts of "extension" and "deduction". See 4.4 and 4.5.

The procedures also enable a target size to be calculated for any standard component, such that the component will have an optimal probability of fit in all its applications.

Worked examples are given in annex B.

Part 4 of ISO 3343 is structured primarily to meet the needs in b) above. It is therefore concerned primarily with the design of buildings in which components (including standard components) are used, and is aimed primarily at building designers who, as engineers, can be expected to be mathematically and statistically competent. It is to meet these aims that part 4 of ISO 3443 deals with

— methods for predicting deviations and specifying tolerances to obtain a particular desired total accuracy in an assembly;

— the effect of specified tolerances on expected size variability;

— the basis for optimization of tolerances for each particular assembly and its elements.

Part 4 of ISO 3443 presupposes calculations only for assemblies with elements of one dimension, such as beams and columns, for the sake of simplicity. However, tables for common cases with elements of two and three dimensions (panels, etc.) are given in the annex to part 4.

1 Scope

This part of ISO 3443 provides a basis for relating joint clearances and target sizes and for the prediction of fit within the context of dimensional coordination, including modular coordination.

1) This part deals with accuracy in terms of target size and limits of size (e.g. upper and lower limits of component size). Alternatively, accuracy can be defined in terms of permitted deviations in relation to a reference size, usually identical with the nominal size. See ISO 1803-1.