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Accuracy and tolerance in design and construction — Guide

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Summary of pages
This document comprises a front cover, an inside front cover, pages I to VI, pages 1 to 84, an inside back cover and a back cover.

Foreword

Publishing information

This British Standard is published by BSI Standards Limited, under licence from The British Standards Institution, and came into effect on 28 February 2022. It was prepared by Technical Committee B/209, *General building codes*. A list of organizations represented on this committee can be obtained on request to the committee manager.

Supersession

This British Standard supersedes BS 5606:1990, which is withdrawn.

Information about this document

To aid the development of a previous edition of this standard, BSI and the Department of Environment commissioned a survey of dimensional variability on projects where tolerances had been specified. The results of the survey were analysed by the Building Research Establishment and included in that edition of the standard. This data is retained in the current edition in the tables in Annex C.

This is a full revision of the standard, and introduces the following principal changes.

- The examples of issues in Section 2 have been updated.
- Section 3 and Section 4 have been updated to include technology and process changes.
- A clear distinction has been made for the use of accuracy and tolerance as independently definable and required characteristics.
- Clarifications and caveats have been added to the BRE industry performance assessment tables from the 1970s and 1980s (in Annex C), including the importance of not relying on these for an assessment of current practice, i.e. tables of industry performance in relation to manufacturer and assembly, and construction tolerances from the 1970s and 1980s have not been updated, but are retained for historical reference for empirical site/manufacturing performance in that period. The assumptions around dimensional variability in the industry current practice (on- or off-site) need to be assessed without reliance on the legacy tables included in this document for historical example and context.

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As a guide, this British Standard takes the form of guidance and recommendations. It should not be quoted as if it were a specification or a code of practice.

It has been assumed in the preparation of this British Standard that the execution of its provisions will be entrusted to appropriately qualified and experienced people, for whose use it has been produced.

Presentational conventions

The guidance in this standard is presented in roman (i.e. upright) type. Any recommendations are expressed in sentences in which the principal auxiliary verb is "should".

Commentary, explanation and general informative material is presented in smaller italic type, and does not constitute a normative element.

Where words have alternative spellings, the preferred spelling of the Shorter Oxford English Dictionary is used (e.g. "organization" rather than "organisation").

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Section 1: General

1 Scope

This British Standard gives guidance on and provides examples of principles that relate to accuracy and tolerance in design and construction activity for the built environment. It is intended to be a practical guide to assist designers and constructors in determining and managing the risks associated with accuracy and tolerance and taking steps to control them appropriately, which, if unmanaged, can be very significant to cost, time and quality.

The fundamental objective is to provide awareness and advice on ways to avoid problems of inaccuracy or fit arising on-site. The need for such advice on any particular project varies, depending on the character of the project and the materials and methods of construction. This British Standard is designed to be relevant to all types of construction including the most sophisticated ones. Those concerned with an individual project can judge the extent to which each section is relevant to their needs.

This British Standard takes into account the growing importance of off-site construction [e.g. MMC (modern methods of construction)] and the changes in technology (e.g. digital measuring equipment) and processes [e.g. BIM (building information modelling)] since the last edition was issued. However, it also retains previous guidance where it provides essential insight and wisdom which might still be relevant today.

While this British Standard is not a guide to productivity in the construction industry, some of the impacts of accuracy and tolerance on productivity, which can be either potential improvements or lessons to be learnt, have been illustrated in Section 2 by practical examples for user understanding. These are not exhaustive but are intended to highlight how these impacts can be significant, either positive or negative, and that this standard can be used as an important part of the quality planning, management and execution of design and build activity for the built environment (buildings and infrastructure).

This British Standard is designed to support the creation and implementation of a project strategy for accuracy and tolerance and provide practical implementation guidance throughout the life cycle and is supported and supports other important standards and processes. It is intended to be applied to buildings and infrastructure works in design and construction and aims to assist in the following:

a) avoiding or resolving problems of inaccuracy or fit by assessing the dimensional needs of a design regarding tolerances, and then designing and specifying appropriately;

b) assessing the likely achievement of tolerances in construction specified for a particular project, and giving guidance on strategies to verify capabilities and mitigate challenges;

c) providing for monitoring and controlling work during construction to check that it is in accordance with specified dimensional tolerance and accuracy for surveys;

d) aiding digital design and engineering (on- and off-site) including the application of BIM for the built environment; and

e) understanding the importance of the accuracy of surveys undertaken pre, during and post construction works to measure existing features and as-built with the ability to support and verify the achievement of design tolerances and fit.

