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Guide to durability of buildings and building elements, products and components

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Publishing and copyright information

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Contents

Summary of pages

This document comprises a front cover, an inside front cover, pages i to iv, pages 1 to 42, 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 30 April 2015. It was prepared by Technical Committee CB/101, *Service Life Planning*. A list of organizations represented on this committee can be obtained on request to its secretary.

Supersession

This British Standard supersedes BS 7543:2003, which is withdrawn.

Information about this document

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

- Terms and definitions have been updated to reflect the BS ISO 15686 series.
- The basis of risk assessment for estimating durability has been revised (see Clause **5**).
- The data on climate have been revised to reflect current understanding, in particular in respect of climate change (see Annex A).
- Annex A gives guidance on the way agents can affect service life.
- Annex B gives guidance on standards and good practice for major building materials.
- Annex C describes some common examples of construction failure that have occurred reasonably recently where expectations of durability have not been met.
- Annex D is an example of a completed design life data sheet showing application of the principles of this guidance to a specific system (building facades).
- Annex E is an annotated list of further reading giving information sources on topics covered in this guide.
- There is also a bibliography updated to reflect the current guidance.

This revision of BS 7543 updates and reinstates certain areas covered in the 1992 version. A series of International Standards, BS ISO 15686, *Buildings and constructed assets – Service life planning*, have been published since 2000. The provisions of BS ISO 15686 have replaced many of the provisions of the previous edition of this standard. However, there are a number of elements of this standard which are complementary to BS ISO 15686. This edition of the standard incorporates the complementary elements.

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 and claims of compliance cannot be made to it.

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.

Contractual and legal considerations

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

Compliance with a British Standard cannot confer immunity from legal obligations.

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Introduction

In order to predict the durability and the possible overall life of buildings, many factors need to be considered. These include practitioners' experience of component or material durability in practice, results of assessments and tests, and the possible effects of the actions of agents on different parts of the building or civil engineering structures. It is also important that this information is communicated clearly to the client and the project team so that the long-term performance implications of proposed designs can be understood and agreed.

For simplicity the term "parts" has been used throughout to cover both whole buildings and building elements, products and components.

Predicting durability is not an exact science, but a risk-based approach to the consideration of failure and acceptable service life. Values calculated for the predicted service life of a building and its parts can sometimes be no more than an informed estimation (for example, for novel materials or for unusual combinations of specific project circumstances). It is usually helpful to state the facts, assumptions and references on which the values are based.

Predictions of the durability of buildings have to take into account the variability of operating conditions, environment, workmanship, the quality and frequency of maintenance and the practical problems surrounding the storage, handling, installing and inspection of materials or components on a construction site. Maintaining, repairing and replacing buildings and assets across many sites or projects can provide a wealth of experience(s) on durability. However, there is a lack of systematically collated data that can form a basis from which durability can be accurately predicted for future projects.

NOTE 1 Although BS 5760 dealt comprehensively with reliability, maintainability and availability, in all industries, it was considered necessary to provide a separate publication specifically for the construction industry. Many of the parts of BS 5760 (but not all) have been superseded by applicable CEN standards, and one in particular is relevant which is BS EN 60812 which describes failure mode effect and criticality analysis (FMECA). Specific guidance on the durability of particular parts of buildings is given in many other British Standards, some of which are referred to in Annex B and Annex C. The design life of parts of a building will often need to be less than the design life of the whole building and this can be perfectly compatible with the usage and refurbishment cycles of normal building occupancy. However, achieving adequate durability without excessive expenditure or consumption of scarce resources is essential for achieving sustainability.

NOTE 2 Attention is drawn to the Construction Products Directive [1].

NOTE 3 Further guidance on improving the collection of data from buildings during their in-use phase can be found in BS ISO 15686-7.

1 Scope

This British Standard gives guidance on durability, design life and predicted service life of buildings, constructed assets and their parts. It applies to both new and existing buildings.

This standard also gives guidance on communicating and recording information on the service and design life of buildings, infrastructure and their components and/or assets when a detailed brief is being developed.