

## Expert commentary

# **BS 8500-1:2023** — *Concrete – Complementary British Standard to BS EN 206 – Part 1: Method of specifying and guidance for the specifier*

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## 1 Overview

BS 8500-1:2023 is the first part of the two-part complementary British Standard to BS EN 206:2013+A2:2021. It provides guidance on the methods of specification of concrete including provisions to provide adequate cover to reinforcement to prevent corrosion through the actions of carbonation and chloride ingress as well as limiting values for concrete characteristic strength, minimum cement content and maximum water/cement ratio to resist the effects of freeze/thaw and, sulfate and sea water attack. The standard was first published in 2002 to give engineers the guidance to be able to specify concrete to the requirements of BS EN 1992 (Eurocode 2) – Design of concrete structures.

There have been a number of revisions and amendments since it was first published to account for revisions of interrelated standards and to meet the needs of the United Kingdom construction industry. This revision, which wholly replaces BS 8500-1:2015+A2:2019, is a response to the needs of concrete construction and to incorporate cements introduced in a new standard, BS EN 197-5:2021. In an industry not normally known for rapid change and acceptance of innovation, the need to decarbonize concrete has become one of the main priorities for construction and, as a part of that process, the use of lower carbon concrete is essential. This is the first revision of this standard with the main purpose of improving sustainability of concrete.

This commentary highlights the main changes and discusses the reasoning behind those amendments.

### 1.1 Reasons for change

The main reason for this revision is to include and give guidance to the use in practice of cements and their equivalent combinations introduced in the new standard BS EN 197-5:2021. These lower carbon cements use limestone fines in combination with Portland cement and another addition, such as ggbs, at greater proportions than allowed in BS EN 197-1:2011. This gives specifiers the opportunity to use less carbon-intensive concrete, more options for cements and combinations, and to be able to combine more than one of these with Portland cement and at proportions (around 50%) that are familiar to the United Kingdom market. As the UK has a long history of producing cements by blending cementitious materials in the concrete mixer, called "combinations", instead of using a preblended cement from a cement manufacturer, the guidance has to allow for the varying proportions that could be produced from two or more separate silos containing various cements and additions.

A two-year study was completed to assess the relative performance of these new cements which allowed their categorization and inclusion into the standard.

As well as the changes summarized below, the opportunity was taken to correct typographical errors, improve the format of some tables that were difficult to read, update references and to align guidance with other standards.

### 1.2 Summary of changes

- Inclusion of BS EN 197-5 cements and their equivalent combinations as general purpose cements
- Introduction of the combined performance category for cements and combinations which categorizes these by their resistance to sulfate attack and chloride ingress
- Removal of minimum cement content and water/cement ratio as limiting values for resistance to corrosion of reinforcement due to carbonation
- Removal of strength as a limiting value for resistance to corrosion of reinforcement due to chloride ingress
- Revision of Table A.6 to allow easier specification of the increased number of cements and combinations for durability
- Improved guidance on identity testing
- The identity testing strength criteria for lower strength concrete to align with BS EN 13791:2019
- Improved guidance on consistence retention
- Guidance on digital monitoring and measurement
- Indicative strengths from cements and combinations
- Corrections and minor clarifications
- All references have been updated

## 2 Main Commentary

### 2.1 Scope of BS 8500-1

The scope of BS 8500-1 is unchanged from the previous version. It describes methods of specifying concrete and gives guidance for the specifier. It is the complementary standard to BS EN 206 and contains the national provisions that are


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