

Aggregates —

Part 3: Aggregates for mortar — Guidance on the use of BS EN 13139

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Foreword

This Published Document has been prepared under the direction of Subcommittee B/502/1, Aggregates for mortar. It is one of nine parts that give guidance on the use and application of a series of European Standards for aggregates. These European Standards were prepared by CEN/TC 154, Aggregates, and have been adopted as British Standards. Conflicting British Standards relating to aggregates will be withdrawn in June 2004.

This part of PD 6682 gives guidance on the use of BS EN 13139 which specifies requirements for aggregates for mortar. BS EN 13139 supersedes BS 1199 and 1200:1976 which will be withdrawn in June 2004. BS EN 13139 also supersedes the conflicting requirements for levelling screed specified in BS 8204-1:2002. BS 8204-1 will be amended to remove these conflicting requirements at the latest by June 2004.

NOTE Users of BS 1199 and 1200:1976 should contact BSI Customer Services for confirmation of withdrawal. Users of BS 8204-1:2002 should contact BSI Customer Services for confirmation of amendment.

Attention is drawn to the fact that BS EN 13139 fully takes into account the requirements of the European Commission mandate M125, Aggregates, given under the EU Construction Products Directive (89/106/EEC) [1].

Attention is also drawn to the fact that BS EN 13139 uses the term “fine aggregate” instead of the term “sand” which has traditionally been used in the UK. BS EN 13139:2002, 3.7 specifically defines fine aggregates as having an upper sieve size of $D \leq 4$ mm.

Guidance on other European Standards in the aggregate series is given in the following parts of PD 6682.

- *Part 1: Aggregates for concrete — Guidance on the use of BS EN 12620.*
- *Part 2: Aggregates for bituminous mixtures and surface treatments for roads, airfields and other trafficked areas — Guidance on the use of BS EN 13043.*
- *Part 4: Lightweight aggregates for concrete, mortar and grout — Guidance on the use of BS EN 13055-1.*
- *Part 5: Lightweight aggregates for bituminous mixtures and surface treatments and for unbound and bound applications excluding concrete, mortar and grout — Guidance on the use of BS EN 13055-2.¹⁾*
- *Part 6: Aggregates for unbound and hydraulically bound materials for use in civil engineering work and road construction — Guidance on the use of BS EN 13242.*
- *Part 7: Armourstone — Guidance on the use of BS EN 13383.*
- *Part 8: Aggregates for railway track ballast — Guidance on the use of BS EN 13450.*
- *Part 9: Guidance on the use of European test method standards.*

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

This Published Document is not to be regarded as a British Standard.

Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 14, an inside back cover and a back cover.

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¹⁾ Both BS EN 13055-2 and PD 6682-5 are in preparation.

Introduction

This document provides guidance on the use of BS EN 13139 in the UK. BS EN 13139 supersedes the corresponding conflicting British Standard for mortar aggregates BS 1199 and 1200. However, whilst BS EN 13139 describes aggregates for mortar in a different manner to established UK practice, and in some cases uses different test methods to evaluate their properties, there is no change to the essential character of the aggregates in actual use in the UK.

Guidance on the description and grading of fine aggregates that make suitable mortar products is given in Annex A. This includes a full list of established British Standard descriptions alongside their equivalent European designations. Further advice and recommendations on masonry mortar is given in Annex B.

BS EN 13139 specifies a range of categories for properties to enable specifiers and users to select appropriate limiting values for the wide range of aggregates to be used in mortars within Europe. In most instances, provision is also made for producers to identify a declared value for properties when the value is outside indicated categories.

This UK guidance recommends limiting values for aggregate properties within the ranges permitted in BS EN 13139. Where possible, these recommended values are equivalent to those specified in BS 1199 and 1200.

An example specification listing recommended BS EN 13139 aggregate designations for particular properties is provided in Annex C. It can be applied to most general uses of aggregates in mortar.

BS EN 13139 also includes recycled aggregates within its scope and indicates that their suitability should be assessed in accordance with the regulatory requirements in the place of use. However, there is little experience in the use of recycled aggregates in mortar in the UK and no recommendations are included in this guidance.

Fine aggregate sizes in BS EN 13139 are described in a different manner to those described in BS 1199 and 1200. The fine aggregate fraction described in BS EN 13139 is linked to a 4 mm size or less, although with a greater oversize tolerance there will generally be little actual change in gradings in practice. For particular uses, a fine aggregate with an upper 8 mm nominal size is also included. The gradings of fine aggregates in accordance with BS EN 13139 are also based on different principles and place an emphasis on consistency. Namely that the supplier declares the typical grading for the fine aggregate and the tolerances within which it may vary. These tolerances are restricted by BS EN 13139 to given values.

BS EN 13139 also gives requirements for special bedding materials and repair mortars that have not previously been specified in a British Standard.

1 Scope

This part of PD 6682 gives guidance on the use of BS EN 13139 which specifies the properties of aggregates and filler aggregates obtained by processing natural, manufactured or recycled materials and mixtures of these aggregates for use in mortar. This includes masonry mortar, floor/screed mortar, plastering mortar, rendering mortar, special bedding materials, repair mortar and grouts.

NOTE Lightweight aggregates for mortar are covered by BS EN 13055-1.

Guidance is also given on the additional requirements in BS EN 13139 for manufactured aggregates.

2 Overview of BS EN 13139

2.1 General requirements

BS 1199 and 1200 specifies requirements for the grading of building sands and the quality of fine aggregates.

Details for the provision of data on other sand properties requested by the specifier, e.g. group classification, shape, surface texture, relative (particle) density, water absorption and bulk density, are also included.

BS EN 13139 changes and extends these properties and data requirements to include the following when required by the aggregate user:

- a) fines content;
- b) particle shape and shell content for aggregate fractions coarser than 4 mm;
- c) resistance to freezing and thawing;
- d) water-soluble chloride ion content;
- e) acid-soluble sulfate content;
- f) total sulfur content;
- g) constituents which alter the rate of setting and hardening;
- h) limits for the water-soluble matter and loss of ignition of manufactured aggregates.

2.2 Evaluation of conformity

BS EN 13139:2002, Clause 8 requires that producers undertake and on request declare the results from:

- a) initial type tests used:
 - i) to characterize properties for new sources of aggregates;
 - ii) when there is a major change in the raw materials or processing which can effect the properties of the aggregates;
- b) factory production control to monitor conformity of the aggregates with the relevant requirements and the producer's declared values.

Minimum test frequencies are specified in BS EN 13139:2002, Table E.1.

Guidance on the requirements for attestation of conformity and compliance with the provisions of the EU Construction Products Directive [1] are given in Clause 4.

3 Requirements of BS EN 13139

3.1 General

Each clause in BS EN 13139 that specifies aggregate properties, i.e. Clause 5, Clause 6 and Clause 7, starts with a general subclause which draws attention to the necessity only to specify those properties relevant to the particular aggregate and end use of the aggregate. Where this is the case the wording "when required" is used.

For particular properties, i.e. fines content and acid-soluble sulfate content, tables of specified requirements allow the user to choose an appropriate "category" for each of these properties.

When the value obtained for a particular property is outside the indicated limit or categories, the producer can provide a declared value. For example, if the acid-soluble sulfate content for aggregates other than air-cooled blast-furnace slag exceeds 0.8 % loss by mass, the producer can state the maximum value of AS_{Declared} . Thus if this value were 0.9 % the producer would state $AS_{0.9}$ and users should determine whether this is adequate for their purposes. It should be noted that in the UK a value of 0.9 % for this property would not be acceptable for most mortars and the values recommended in 3.3.3 should be used.

3.2 Geometrical requirements

3.2.1 Aggregate size (BS EN 13139:2002, 3.5, 3.9 and 5.2)

The series of European Standards on aggregates specifies the following three options for sieve size ranges for use in the description of aggregate sizes:

- a) basic set;
- b) basic set plus set 1;
- c) basic set plus set 2.

BS EN 13139 does not give requirements for sieve sizes, however, in the UK aggregates will generally be supplied to the basic set plus set 2. For completeness, this set of sieve sizes is given in Table 1.