



BSI Standards Publication

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Aggregates

Part 2: Aggregates for bituminous mixtures and surface treatments for roads, airfields and other trafficked areas – Guidance on the use of BS EN 13043

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Foreword

Publishing information

This Published Document is published by BSI Standards Limited, under licence from The British Standards Institution and came into effect on 31 October 2009. It was prepared by Technical Committee B/502, *Aggregates*. A list of organizations represented on this committee can be obtained on request to its secretary.

Supersession

PD 6682-2:2009+A1:2013 supersedes PD 6682-2:2009, which is withdrawn.

Information about this document

Text introduced or altered by Amendment No. 1 is indicated in the text by tags **A1** **A1**. Minor editorial changes are not tagged.

This part of PD 6682 gives guidance on the use of BS EN 13043, which specifies requirements for aggregates for bituminous mixtures and surface treatments for roads, airfields and other trafficked areas. BS EN 13043 superseded BS 63-1:1987, BS 63-2:1987 and BS 1047:1983, which were withdrawn in June 2004.

PD 6682-2 is one of nine parts of PD 6682, *Aggregates*, that give guidance on the use and application of a series of European Standards for aggregates:

- *Part 1: Aggregates for concrete – Guidance on the use of BS EN 12620;*
- *Part 3: Aggregates for mortar – Guidance on the use of BS EN 13139;*
- *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;*
- *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.*

Attention is drawn to the fact that BS EN 13043 fully takes into account the requirements of the European Commission mandate M/125, Aggregates [1], given under the EU Construction Products Directive (89/106/EEC) [2].

Presentational conventions

The word “should” is used to express recommendations of this Published Document. The word “may” is used in the text to express permissibility, e.g. as an alternative to the primary recommendation of the clause. The word “can” is used to express possibility, e.g. a consequence of an action or an event.

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 Published Document cannot confer immunity from legal obligations.

0 Introduction

This document provides guidance for the UK on the use of BS EN 13043, which superseded the British Standards for aggregates for use in bituminous mixtures and surface treatments, BS 63 and BS 1047.

BS EN 13043 has been amended since it was first published in 2002. In 2004, Corrigendum No. 1 corrected the CE Marking information in Annex ZA and amended a note about national regulations for dangerous substances.

NOTE The term "asphalt" is often used in the UK as the generic term that refers to the range of bituminous mixtures used on roads and other paved areas. BS EN 13043 uses the term "bituminous mixtures", as does BS EN 13108. Both terms are to be considered as synonymous.

BS EN 13043 specifies a range of categories for properties to enable purchasers to select appropriate limiting values for the wide range of aggregates in bituminous mixtures and surface treatments 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.

The purchaser needs to define BS EN 13043 categories for properties that are relevant to the particular end-use of an aggregate. Example specifications listing aggregate designations for particular properties for aggregates with different end-uses are provided in Annex A, Annex B, Annex C, Annex D and Annex E.

BS EN 13043 includes manufactured and recycled aggregates within its scope and indicates that their suitability should be assessed in accordance with the regulatory requirements in the place of use. In the UK, further guidance on recycled aggregates can be found in the Highways Agency's Specification for Highway Works [3].

1 Scope

This part of PD 6682 gives guidance for the UK on the use of BS EN 13043, which specifies the properties of aggregates and filler aggregates obtained by processing natural, manufactured or recycled materials for use in bituminous mixtures and surface treatments for roads, airfields and other trafficked areas.

NOTE For simplicity, this document uses the shortened term "bituminous mixtures".

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

BS EN 933-11, *Tests for geometrical properties of aggregates – Part 11: Classification test for the constituents of coarse recycled aggregate*

BS EN 13043, *Aggregates for bituminous mixtures and surface treatments for roads, airfields and other trafficked areas*

BS EN 16236, *Evaluation of conformity of aggregate*

3 Overview of BS EN 13043

3.1 General requirements

3.1.1 General

BS EN 13043 specifies requirements using the following groups of properties:

- geometrical properties, including grading, shape and fines content;
- mechanical and physical properties, including resistance to fragmentation;
- weathering properties, including freeze-thaw resistance;
- chemical properties, including volume stability of slags.

Additional aggregate properties, such as polishing and abrasion resistance, have been called up in the UK in the Highways Agency's Specification for Highway Works [3].

3.1.2 Geometrical requirements

The requirements specified in BS EN 13043 for the following geometrical properties are usually considered appropriate for aggregates used in bituminous mixtures in the UK.

- a) Aggregate size, described using the designation *d/D*.
- b) Grading, measured by the washing and sieving test method specified in BS EN 933-1.
- c) Fines content, measured as part of the washing and sieving test method specified in BS EN 933-1.
- d) Shape of coarse aggregate, measured by determining the flakiness index as specified in BS EN 933-3.
- e) Percentage of crushed and broken surfaces in coarse aggregate, measured in accordance with BS EN 933-5.

Further details are given in 4.2.

3.1.3 Physical requirements

The requirements specified in BS EN 13043 for the following physical properties are usually considered appropriate for aggregates used in bituminous mixtures in the UK.

- a) Resistance to fragmentation, measured by the Los Angeles test method as specified in BS EN 1097-2.
- b) Resistance to polishing of coarse aggregate for surface courses, measured by determining the polished stone value (PSV) in accordance with BS EN 1097-8.
- c) Resistance to surface abrasion, measured by determining the aggregate abrasion value (AAV) in accordance with BS EN 1097-8.

- d) Particle density and water absorption, measured in accordance with BS EN 1097-6 and declared on request.
- e) Bulk density, measured in accordance with BS EN 1097-3 and declared on request.

Further details are given in 4.3.

3.1.4 Durability requirements

BS EN 13043 initially specifies durability in terms of resistance to freezing and thawing, using the water absorption test in BS EN 1097-6. This is used as a screening test for weathering properties.

In the UK, it is usually considered appropriate for durability of aggregates used in bituminous mixtures to be specified using the magnesium sulfate soundness test in BS EN 1367-2.

Further details are given in 4.3.8.

3.1.5 Chemical requirements

The requirements specified in BS EN 13043 for the following chemical properties for coarse and fine aggregates are usually considered appropriate for aggregates used in bituminous mixtures in the UK, when tested in accordance with BS EN 1744-1.

- a) Dicalcium silicate disintegration of air-cooled blast furnace slag.
- b) Iron disintegration of air-cooled blast furnace slag.
- c) Volume stability of steel slag aggregate.

Further details are given in 4.4.

3.1.6 Requirements for filler aggregates

The requirements specified in BS EN 13043 for the following properties are usually considered appropriate for the filler aggregates traditionally used in the UK.

- a) Grading, tested in accordance with the "air jet" method specified in BS EN 933-10.
- b) Loose bulk density in kerosene, tested in accordance with the appropriate annex to BS EN 1097-3.
- c) Particle density, tested in accordance with BS EN 1097-7 and declared on request.

BS EN 13043 also specifies the use of test methods that are based on experience with mixed fillers that are rarely used in the UK. The specified tests include:

- 1) voids in dry compacted filler (Rigden), tested in accordance with BS EN 1097-4; and
- 2) "delta ring and ball", tested in accordance with BS EN 13179-1.

Further details are given in 4.5.

3.2 Evaluation of conformity

 BS EN 13043 requires that producers undertake initial type tests and factory production control in accordance with BS EN 16236 to ensure that the product conforms to BS EN 13043 and to declared values as appropriate. 