

Aggregates —

Part 8: Aggregates for railway ballast — Guidance on the use of BS EN 13450

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Committees responsible for this Published Document

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- County Surveyors' Society
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- Institution of Structural Engineers
- Quarry Products Association
- UK Steel
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Foreword

This Published Document has been prepared under the direction of Subcommittee B/502/4, Aggregates for unbound and hydraulically bound materials. 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 Conflicting British Standards relating to aggregates will be withdrawn in June 2004.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 13450 which specifies requirements for aggregates for railway ballast. BS EN 13450 does not supersede any British Standard, but it does specify requirements that necessitated the reissue of Network Rail's specification for track ballast and stoneblower aggregate (STBSA) [1].

NOTE The STBSA [1] was reissued in 2000 to include Appendix E that gives an updated specification for railway ballast that conforms to BS EN 13450. It is intended that the 2000 edition will be completely revised at a later date to remove all requirements that conflict with BS EN 13450. Users of the STBSA should contact Network Rail for confirmation of revision.¹⁾

Attention is drawn to the fact that BS EN 13450 fully takes into account the requirements of the European Commission mandate M125, Aggregates, given under the EU Construction Products Directive (89/106/EEC) [2].

Guidance on the other European Standards in the 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 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 13055-2.²⁾*
- *Part 6: Aggregates for unbound and hydraulically bound materials for use in civil engineering works and road construction — Guidance on the use of BS EN 13242.*
- *Part 7: Armourstone — Guidance on the use of BS EN 13383.*
- *Part 9: Guidance on the use of European test method standards.*

This publication does not purport to include all 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 13 and a back cover.

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¹⁾ Network Rail, 40 Melton Street, London NW1 2EE. Tel.: 020 7557 8000.
www.networkrail.co.uk.

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

Introduction

This document provides guidance on the use of BS EN 13450 in the UK. BS EN 13450 specifies requirements for aggregates for railway ballast that necessitated the reissue of Network Rail's specification for track ballast and stoneblower aggregate (STBSA) [1].

NOTE This guide uses the STBSA as a basis against which to compare the requirements of BS EN 13450. This has been done on the premise that the STBSA is:

- a) the rail industry's most widely used guidance for the specification of railway ballast; and
- b) written in line with the Rail Safety and Standards Board's (RSSB's) Railway Group Standard on track bed and track drainage [3].

However, it is important to note that other guidance documents for railway ballast might be available.

Whilst BS EN 13450 describes aggregates for railway ballast in a different manner to established UK practice and in some cases uses different test methods to evaluate their properties, there is little change to the essential character of the aggregates in actual use in the UK.

BS EN 13450 specifies a range of categories for properties to enable users to select appropriate limiting values for the range of aggregates used in railway ballast. 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 13450. Where possible, these recommended values are equivalent to those specified in the Network Rail specification for railway ballast.

Specifiers will need to define BS EN 13450 categories for properties that are relevant to the particular end-use of an aggregate. An example specification listing recommended BS EN 13450 aggregate categories for particular properties for aggregates for railway ballast is provided in Annex A.

Railway ballast has long been specified alongside stoneblower aggregate. Stoneblower aggregate is used to pack sleepers by being pneumatically blown under them. It is, as a consequence, much smaller in size than railway ballast. BS EN 13450, however, does not give any guidance on how to specify stoneblower aggregate and as such, no guidance on specifying stoneblower aggregate in accordance with the requirements of BS EN 13450 is included on this guide.

BS EN 13450 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.

1 Scope

This part of PD 6682 gives guidance on the use of BS EN 13450 in the UK. BS EN 13450 specifies the properties of aggregates obtained by processing natural, manufactured or recycled materials for railway ballast.

NOTE Stoneblower aggregate, which is used to pack sleepers by being pneumatically blown under them, is not specified in BS EN 13450. Therefore, no guidance on specifying stoneblower aggregate in accordance with the requirements of BS EN 13450 is included in this guide.

2 Overview of BS EN 13450

2.1 General

UK specifications relating to aggregates for railway ballast, notably the STBSA [1], have specified requirements for the following aggregate properties.

- a) Dimensions (grading).
- b) Flakiness.
- c) Elongation.
- d) Aggregate crushing value.
- e) Wet attrition value.

BS EN 13450 gives requirements for different properties, including different test methods. These different geometrical, physical (mechanical) and durability properties are listed in **2.2**, **2.3** and **2.4**.

NOTE The STBSA was reissued by Network Rail in 2000 to include Appendix E that gives an updated specification for railway ballast that conforms to BS EN 13450. Network Rail now uses railway ballast that conforms to their updated specification in Appendix E of the STBSA.

2.2 Geometrical requirements

Requirements for the following geometrical properties are specified for railway ballast in BS EN 13450:2002, Clause **6** but did not use to be specified in the STBSA.

- a) Fine particles content, measured in accordance with BS EN 933-1.
- b) Fines content, measured in accordance with BS EN 933-1.
- c) Particle length, measured in accordance with BS EN 13450:2002, **6.7**.

2.3 Physical requirements

The term “mechanical properties” used in British Standards relating to aggregates is replaced in BS EN 13450 by the term “physical properties”. Requirements for the following physical properties are specified for railway ballast in BS EN 13450:2002, Clause **7** but did not use to be specified in the STBSA.

- a) Resistance to fragmentation, measured by the Los Angeles test method (reference method) as specified in BS EN 1097-2.
- b) Resistance to wear, measured by determining the micro-Deval coefficient in accordance with BS EN 1097-1 and the conditions specified in BS EN 13450:2002, Annex E. This test method is derived from a French (AFNOR) test method.
- c) Sonnenbrand of basalt, measured in accordance with BS EN 1367-3.