SINGAPORE STANDARD

SS EN 206-1 : 2009

(ICS 91.100.30)

SPECIFICATION FOR

Concrete

Part 1 : Specification, performance, production and conformity

This national standard is the identical implementation of EN 206 : 2000 and is adopted with permission of CEN, Rue de Stassart 36, B-1050 Brussels

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National Foreword

This Singapore Standard was prepared by the Technical Committee on Building Structure and Sub-structure under the purview of the Building and Construction Standards Committee.

This standard is the result of the review of SS 289 : Parts 1 to 4 : 2000 – 'Specification for concrete'. SS EN 206-1 together with SS 544 – 'Concrete – Complementary Singapore Standard to SS EN 206-1 – Part 1 : Method of specifying and guidance for the specifier and Part 2 : Specification for constituent materials and concrete' replaces the SS 289 series of standards.

This Singapore Standard is identical to EN 206-1 'Concrete – Part 1 : Specification, performance, production and conformity' and is adopted with permission of CEN, rue de Stassart 36, B-1050 Brussels.

This SS EN incorporates the CEN Amendments 1 (July 2004) and 2 (June 2005). The start and finish of text introduced or altered by CEN amendment is indicated in the text by tags, eg, text altered by CEN amendment A1 is indicated by $^{A1>}$ $^{<A1}$.

Attention is drawn to the following:

1. Where references are made to European Standards, they have been replaced by the relevant Singapore Standards where applicable, e.g. "European Standard" replaced by "Singapore Standard" and "EN 206-1" replaced by "SS EN 206-1".

2. The comma, used throughout as a decimal marker, has been replaced by a full point on the baseline.

3. The National Foreword replaces the Foreword of EN 206-1.

4. Singapore guidelines (informative) have been included in Annexes ZZA and ZZB. The modifications concern circumstances which are typical for Singapore (climatic conditions such as temperature). The slump flow guidelines are included because self-compacting concrete is being used in construction in Singapore.

Relevant EN test methods are listed in Clause 2. The temperature used in the test method specifications is only for conformity testing requirements and may not represent the temperature when the material is used in concrete.

Aspects relating to the execution are covered in EN 13670-1 or other relevant standards.

The context in which this standard functions is illustrated in Figure 1.

This standard is only operable with product standards or equivalent specifications for constituent materials (i.e. cement, aggregates, additions, admixtures and mixing water) and related test methods for concrete.

At the time of publication, this standard is expected to be used by the Building and Construction Authority.

Attention is drawn to the possibility that some of the elements of this Singapore Standard may be the subject of patent rights. SPRING Singapore shall not be held responsible for identifying any or all of such patent rights.

NOTE

1. *Singapore Standards are subject to periodic review to keep abreast of technological changes and new technical developments. The changes in Singapore Standards are documented through the issue of either amendments or revisions.*

2. *Compliance with a Singapore Standard does not exempt users from legal obligations.*

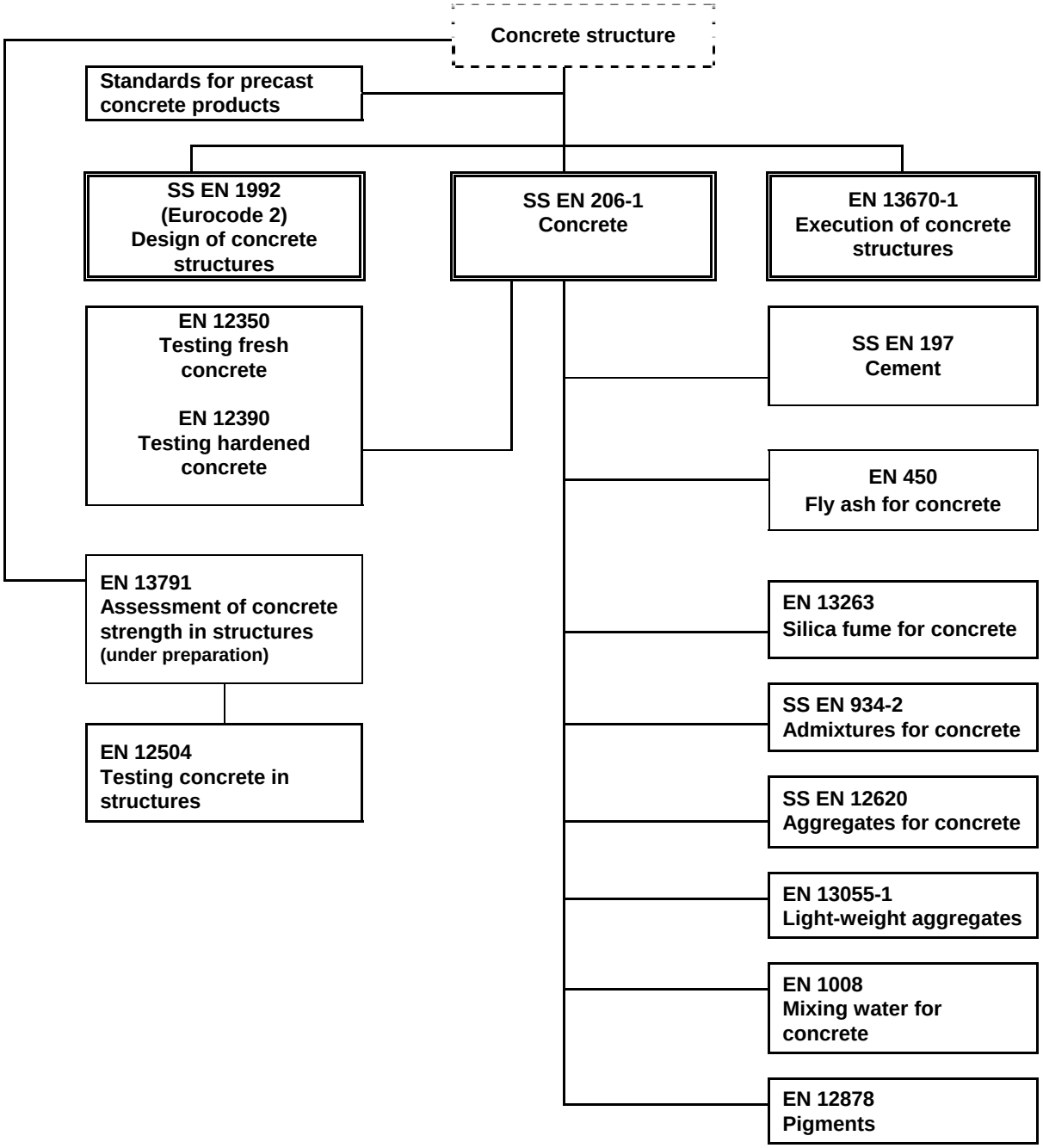

Figure 1 – Relationships between SS EN 206-1 and standards for design and execution, standards for constituent materials and test standards

Introduction

The EN 206-1 is applied in Europe under different climatic and geographical conditions, different levels of protection and under different, well established, regional traditions and experience. Classes for concrete properties have been introduced to cover these situations. Where such general solutions were not possible, the relevant clauses contain permission for the application of national standards or provisions valid in the place of use of the concrete.

Consideration was given to detailing a performance-related approach to the specification of durability. Until CEN/TC 104 or ISO has developed performance related methods for assessing durability, the UK approach as adopted in SS 544 is to be applied in Singapore.

This EN incorporates rules for the use of constituent materials that are covered by European standards with modified test temperatures for use in Singapore. Other by-products of industrial processes, recycled materials, etc are in current use based on local experience.

This EN defines tasks for the specifier, producer and user. For example, the specifier is responsible for the specification of concrete, Clause 6**,** and the producer is responsible for conformity and production control, Clauses 8 and 9. The user is responsible for placing the concrete in the structure. In practice there may be several different parties specifying requirements at various stages of the design and construction process e.g. the client, the designer, the contractor, the concreting sub-contractor. Each is responsible for passing the specified requirements, together with any additional requirements, to the next party in the chain until they reach the producer. In the terms of this EN, this final compilation is known as the “specification“. Conversely, the specifier, producer and user may be the same party (e.g. a contractor doing design and build). In the case of ready mixed concrete, the purchaser of the fresh concrete is the specifier and has to give the specification to the producer. This standard also covers the necessary exchange of information between the different parties. Contractual matters are not addressed. Where responsibilities are given for parties involved, these are technical responsibilities.

Notes and footnotes in tables of this standard are normative unless stated otherwise; other notes and footnotes are informative.

Further explanations and guidance on the application of this standard are given in other documents, such as CEN Reports

Specification for concrete – Part 1 : Specification, performance, production and conformity

1 Scope

This Singapore Standard applies to concrete for structures cast in situ, precast structures, and structural precast products for buildings and civil engineering structures.

The concrete may be mixed on site, ready-mixed concrete or produced in a plant for precast concrete products.

This standard specifies requirements for:

- the constituent materials of concrete;
- the properties of fresh and hardened concrete and their verification;
- the limitations for concrete composition;
- the specification of concrete;
- the delivery of fresh concrete;
- the production control procedures;
- the conformity criteria and evaluation of conformity.

This Singapore Standard applies to concrete compacted to retain no appreciable amount of entrapped air other than entrained air. This standard applies to normal-weight, heavy-weight and light-weight concrete.

Other standards for specific products e.g. precast products or for processes within the field of the scope of this standard may require or permit deviations from this standard.

Additional or different requirements may be given in further parts of this standard or in other specific European standards, for example:

- concrete to be used in roads and other trafficked areas;
- concrete using other materials (e.g. fibres) or constituent materials not covered by 5.1;
- concrete with an upper aggregate size of 4 mm or less (mortar);
- special technologies (e.g. sprayed concrete);
- concrete for disposal of liquids and gaseous waste;
- concrete for vessels for storage of polluting substances;
- concrete for massive structures (e.g. dams);
- dry mixed concrete.

NOTE – As long as these standards are not available, provisions valid in the place of use of the concrete may apply.