SINGAPORE STANDARD

SS 477 : 2000

(ICS 91.100.10)

SPECIFICATION FOR

Portland blastfurnace cement

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Foreword

This Singapore Standard was prepared by the Technical Committee for Concrete and Cement under the direction of the Building Materials Product Standards Committee.

It is based on the work of Technical Committee 51, Cement and building limes, of the European Committee for Standardisation (CEN), which has prepared a European Prestandard specification for cements published as DD ENV 197-1. As an intrinsic part of this activity, CEN has published EN 196, a series of methods of testing cement. In consequence, this Singapore Standard specifies requirements in terms of the test procedures in a series under SS 397 based on BS EN 196.

The requirements for compressive strength, physical and chemical properties are specified as characteristic values and conformity is assessed by means of a statistical procedure for continuous inspection operated by the cement manufacturer (autocontrol) (see Annex A). This includes the concept of 'major defects' which are 'likely to reduce materially the usability of the cement for its intended purpose'. However, DD ENV 197-1 is considered to be inappropriate in its entirety for the manufacture of cement in Singapore and the annex therefore incorporates several footnotes identifying specific aspects. In particular, it is assumed, for this edition of this Singapore Standard, that some limits are required for acceptance inspection. Clause 12 therefore gives appropriate values which in several cases are more stringent than those for major defects given in Annex A.

The strength requirements are based on the SS 397 : Part 1 : Section One mortar prism test at 28 days. In addition to the two classes of standard strength, 32.5 and 42.5, with two and three subclasses respectively of early strength, this Singapore Standard includes a higher class of standard strength, 52.5 with two subclasses of early strength, to cover all Portland blastfurnace cements. (see Table 2).

Compositional requirements are expressed as a percentage of the total mass of the constituents but excluding calcium sulfate and any additives. This method of calculation is fully explained in Annex B.

Requirements are not specified for fineness, but the limit in BS 6699 is applicable to the blastfurnace slag constituent where the dry blending method is used (see Clause 6.3).

Guidance on the use of cement has been included in Annex C and attention is drawn to the safety precautions recommended therein when, working with cement. Cement will partially hydrate when exposed to water vapour, Annex C also included guidance on storage.

Product certification. Purchasers are recommended to specify cement manufactured and supplied to a nationally recognised third party product certification scheme.

This Singapore Standard is an adoption of British Standard No. BS 146 : 1996 and was implemented with the permission of the British Standards Institution

NOTE

1. *Singapore Standards are subject to periodic review to keep abreast of technological changes and new technical developments. The revisions of Singapore Standards are announced through the issue of either amendment slips or revised editions.*

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

Specification for Portland blastfurnace cement

1 Scope

This Singapore Standard[1)] specifies requirements for the composition and manufacture and for the strength, physical and chemical properties of two Portland blastfurnace cements, Portland slag cement and blastfurnace cement, as characteristic values. Requirements for marking, provision for information, sampling and testing for acceptance at delivery are also specified. It gives the procedures for the manufacturer's autocontrol system to ensure conformity.

2 References

2.1 Normative references

This Singapore Standard incorporates, by references, provisions from specific editions of other publications. These normative references are made at the appropriate points in the text and the publications are listed at the end of the standard. Subsequent amendments to, or revisions of, any of these publications apply to this Singapore Standard only when incorporated in it by updating or revision.

2.2 Informative references

This Singapore Standard refers to other publications that provide information or guidance. Editions of these publications current at the time of issue of this standard are listed at the end of the standard, but reference should be made to the latest editions.

3 Definitions

For the purpose of this Singapore Standard the definitions in BS 6100 : Section 6.1 apply together with the following:

3.1 Characteristic value

That value of a property corresponding to an acceptable percentage of defects, generally 10% but 5% for the lower strength limits.

4 Cement

NOTE – Cement is a hydraulic binder, i.e it is a finely ground inorganic material which, when mixed with water, forms a paste which sets and hardens by means of hydration reactions and processes and which, after hardening, retains its strength and stability even under water.

4.1 Cement conforming to this Singapore Standard shall, when appropriately batched and mixed with aggregate and water, be capable of producing mortar or concrete which retains workability for a sufficient time and shall after defined periods attain specified strength levels and also possess long-term volume stability.

[1)] Other types of cement standardised in Singapore are specified in SS 26 and SS 476.