

Concrete admixtures —

Part 3: Specification for superplasticizing admixtures

UDC [666.972.16 : 666.9.015.3] : 693.542.4
ICS 91.100.10; 91.100.30

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- Brick Development Association
- British Aggregate Construction Materials Industries
- British Ceramic Research Association
- British Precast Concrete Federation
- British Ready Mixed Concrete Association
- Building Employers' Confederation
- Cement Admixtures Association
- Cement and Concrete Association
- Cement Makers' Federation
- Concrete Society
- County Surveyor's Society
- Department of the Environment (Building Research Establishment)
- Department of the Environment (Property Services Agency)
- Department of Transport
- Electricity Supply Industry in England and Wales
- Federation of Civil Engineering Contractors
- Institution of Civil Engineers
- Institution of Structural Engineers
- Mortar Producers Association
- Plasterers' Craft Guild
- Society of Chemical Industry

This British Standard, having been prepared under the direction of the Cement, Gypsum, Aggregates and Quarry Products Standards Committee, was published under the authority of the Board of BSI and comes into effect on 30 September 1985

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The following BSI references relate to the work on this standard:
Committee reference CAB/3
Draft for comment 84/10893 DC

ISBN 0 580 14588 3

Amendments issued since publication

Amd. No.	Date of issue	Comments
11058	October 2000	Indicated by a sideline

Contents

	Page
Committees responsible	Inside front cover
Foreword	ii
1 Scope	1
2 Definitions	1
3 Sampling	1
4 Performance requirements	1
5 Uniformity tests and requirements	2
6 Provision of information	2
7 Marking	3
Appendix A Preparation of concrete for acceptance tests	4
Appendix B Tests on control mix and test mix concretes	6
Table 1 — Performance tests and requirements for high workability test mix concrete A	1
Table 2 — Performance tests and requirements for water reduced test mix concrete B	2
Table 3 — Uniformity tests and requirements	2
Table 4 — Fine aggregate grading limits	4
Bibliography	8

Foreword

This Part of BS 5075 has been prepared under the direction of the Cement, Gypsum, Aggregates and Quarry Products Standards Committee and is based on an initial draft provided by the Cement Admixtures Association. This Part of this standard incorporates such recommendations of other organizations as the Technical Committee felt were appropriate, and is based on the results of cooperative tests carried out in accordance with earlier drafts of this Part.

This Part of this standard is concerned only with retarding superplasticizing admixtures.

The requirements for non-retarding superplasticizers which were previously covered by this part of BS 5075 have been superseded by the issue of BS EN 934-2 and BS EN 934-6.

Where existing British Standards and specifications call up non-retarding superplasticizers meeting the requirements of BS 5075-3, products with an existing certificate showing compliance with that standard can still be accepted. Products which have been tested to the requirements of BS EN 934-2 should also be accepted as showing technically equivalent performance.

Where standards and specifications call up BS EN 934, it is recommended that for an interim period, BS 5075 certification should be continued to be accepted as technically equivalent.

Accelerating and retarding water-reducing admixtures are covered by BS 5075-1 and admixtures for mortar are covered by BS 4887. All other types of admixture for concrete are now covered by BS EN 934-2.

Admixtures for mortars are covered by BS 4887. Major changes are made to this part of this British Standard by Amendment No. 1 subsequent to the publication of BS EN 934-2.

This Part of BS 5075 specifies acceptance tests which demonstrate the ability of a particular formulation to meet stipulated performance requirements, and admixture uniformity tests which demonstrate that a particular consignment is similar to material which has previously been submitted to the acceptance tests. Either may be carried out by the vendor or at an independent laboratory at the request of the purchaser.

In the acceptance tests, provision has been made for the diverse applications of retarding superplasticizing admixtures in practice and the differing chemical nature of those available. Some of the tests are therefore relevant to the use of retarding superplasticizing admixtures to produce very high workability, whilst the remainder are relevant to obtaining very large reductions in water content.

In the first of these applications, it is usually the intention to produce flowing concrete without drastic alteration of the mix designs employed for normal concrete. Excessive bleeding, segregation, retardation or air-entrainment are undesirable, however, and should not be promoted by the use of superplasticizing admixtures in this type of concrete.

In the second application, a large reduction in water content is required without loss of workability. An extension of initial stiffening time is required within limits and the requirement for early but not later age strength development is relaxed.

The principle has been followed of having one test mix concrete at the same water/cement ratio as a control mix to establish the effect of the admixture on workability and strength. In a second test mix, a fixed water reduction is made and the concrete is tested against specified requirements for workability, stiffening time and strength. An upper limit is placed on the air content of the concrete in both test mixes.

Workability can change rapidly immediately after mixing. However, tests have shown that a relatively stable state is attained within 10 min to 15 min from the completion of mixing and this time has been selected for establishing initial workability. In the case of flowing concrete, there is usually a tendency for the effect of the superplasticizing admixture on workability to diminish steadily with time and, in order to ensure adequate retention of the initial high workability, a requirement for loss of workability on standing has been introduced.

The stiffening time test, which is carried out on mortar sieved from the concrete, is used to determine the times required for a standard needle to indicate a resistance to penetration of 0.5 N/mm^2 and 3.5 N/mm^2 . Work has shown that the time to reach a resistance of 0.5 N/mm^2 corresponds approximately to the extreme limit for placing and compacting concrete, and the time to reach a resistance of 3.5 N/mm^2 gives a guide to the time available for the avoidance of cold joints.

No requirements for tests on hardened concrete have been introduced, apart from those relating to compressive strength. Drying shrinkage, creep, and long term durability are still under investigation, and the effect of superplasticizing admixtures on these properties should be the subject of advice from the admixture manufacturer.

The admixture uniformity tests include determination of dry material content, ash content and chloride ion content. The standard requires that the chloride content of the admixture shall be declared so that the user will be fully aware of the amount of chloride that will be introduced into the concrete, and if necessary will be able to take appropriate precautions.

When a purchaser requires a certificate stating that an admixture complies with this Part of BS 5075, the manufacturer should provide the information given in 6.1. Additional information relating to the correct use of the admixture as given in 6.2 should also be made available on request.

The performance of retarding superplasticizing admixtures should be assessed in the particular concrete to be used because the performance may be affected by changes in concrete composition.

Certification. Attention is drawn to the certification facilities described on the inside back cover of this standard.

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Summary of pages

This document comprises a front cover, an inside front cover, pages i to iv, pages 1 to 8, an inside back cover and a back cover.

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