

Concrete

Part 2. Methods for specifying concrete mixes

Béton
Partie 2. Méthodes de spécification des
mélanges pour béton

Beton
Teil 2. Betonmischungen

Committees responsible for this British Standard

The preparation of this British Standard was entrusted by the Technical Sector Board for Building and Civil Engineering (B/-) to Technical Committee CAB/4, upon which the following bodies were represented:

Association of Lightweight Aggregate Manufacturers
 Association of Metropolitan Authorities
 Association of Quality Pulverised Fuel Ash Suppliers
 British Aggregate Construction Materials Industries
 British Cement Association
 British Civil Engineering Test Equipment Manufacturers' Association
 British Precast Concrete Federation
 British Ready Mixed Concrete Association
 Building Employers' Confederation
 Cement Admixtures Association
 Cementitious Slag Makers Association
 Concrete Society
 County Surveyors' Society
 Department of the Environment (Building Research Establishment)
 Department of the Environment (Property Services Agency)
 Department of Transport
 Department of Transport (Transport and Road Research Laboratory)
 Electricity Association
 Federation of Civil Engineering Contractors
 Institute of Concrete Technology
 Institution of Civil Engineers
 Institution of Highways and Transportation
 Institution of Structural Engineers
 Institution of Water and Environmental Management
 Royal Institution of Chartered Surveyors
 Sand and Gravel Association
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Amendments issued since publication

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7175	July 1992	Indicated by a line in the margin

Amendment No. 2
published and effective from 15 October 1995
to BS 5328 : Part 2 : 1991

Concrete
Part 2. Methods for specifying concrete mixes

NOTE. This amendment takes account of the guidance in BRE Digest 363.

Clause 0. Introduction

In paragraph 2, line 11 delete 'confirmity' and substitute 'conformity'.

In paragraph 2, line 13 delete 'BS 5750 : Part 1 (EN 29001)' and substitute 'BS EN ISO 9001'.

In paragraph 6, last line delete 'BS 5750' and substitute 'BS EN ISO 9000'.

AMD 8759/October 1995

Clause 5.2 Essential items

After item (f) insert the following as item (g).

(g) class of exposure to sulphate (see **4.3.4** of
BS 5328 : Part 1 : 1991), if appropriate,
including any modifications required by tables
7c and 7d.

Renumber the existing items (g), (h), (i), and (j) as '(h), (i), (j) and (k)'.

AMD 8759/October 1995

Clause 5.3 Optional items (as amended by Amendment No. 1)

In line 4, item (b) delete 'table 7' and substitute 'table 7b'.

AMD 8759/October 1995

Table 3. Standard mixes and related strengths

In line 2 of column 2 delete 'assued' and substitute 'assumed'.

AMD 8759/October 1995

Clause 13. Designated mix

In line 6 immediately after 'corresponding designation' insert the following.

For FND mixes, the purchaser is responsible for
specifying the designated mix appropriate to the
sulphate class given in table 7a of BS 5328 : Part 1,
including any modification required in tables 7c
and 7d.

AMD 8759/October 1995

**Table 6. Requirements for designated mixes with aggregate of 20 mm nominal
maximum size**

Delete the table and substitute the following.

Table 6. Requirements for designated mixes with aggregate of 20 mm nominal maximum size

Mix designation	Characteristic strength	Cement group ¹⁾	Minimum cement ²⁾ content	Maximum free water/cement ratio
	N/mm ²		kg/m ³	
GEN 0	7.5	1	120	N/A
GEN 1	10	1	175	N/A
GEN 2	15	1	200	N/A
GEN 3	20	1	220	N/A
GEN 4	25	1	250	0.7
FND 2	35	1 ³⁾	330	0.50
		2	300	0.55
		3	280	0.55
FND 3	35	2	340	0.50
		3	320	0.50
FND 4A	35	2	380	0.45
		3	360	0.45
FND 4B	35	3	360	0.45
PAV 1 ⁴⁾	35	1	300	0.60
PAV 2 ⁴⁾	40	1(a)	320	0.45
		1(b, c, d, f and g)	340	0.45
RC 30	30	1	275	0.65
RC 35	35	1	300	0.60
RC 40	40	1	325	0.55
RC 45	45	1	350	0.50
RC 50	50	1	400	0.45

¹⁾ See 16.1.²⁾ See 17.3 and 17.4.³⁾ Depending on the proportion of pfa, a cement complying with BS 6588 may be classified as a group 2(a) cement.⁴⁾ The concrete contains an air entraining admixture to give a mean total air content by volume of 5.5 %, 4.5 % or 7.5 % with aggregate of 20 mm, 40 mm or 10 mm nominal maximum size respectively.

AMD 8759/October 1995

Clause 15.3 Optional items

In line 3 delete 'group 1(c)' and substitute 'cement group 1'

In line 4 delete 'group 2(c) in 16.1,'

In note 1, line 2, after 'suitable for' insert 'obtaining satisfactory cast and direct finished surfaces nor for'.

AMD 8759/October 1995

Clause 16.1 Cements (as amended by Amendment No. 1)

After the first sentence delete the text and substitute the following.

Cement Group 1

- (a) Portland cement conforming to BS 12.
- (b) Portland blastfurnace cements conforming to BS 146, with not more than 55 % slag by mass of the nucleus unless otherwise agreed by the purchaser.
- (c) High slag blastfurnace cement conforming to BS 4246 with not more than 55 % slag by mass of the nucleus unless otherwise agreed by the purchaser.
- (d) Portland pulverized-fuel ash cements conforming to BS 6588.
- (e) Pozzolanic pulverized-fuel ash cement conforming to BS 6610.
- (f) Combinations of Portland cement conforming to BS 12 with ggbs conforming to BS 6699 where there is not more than 55 % ggbs by mass of the combination unless agreed otherwise with the purchaser.
- (g) Combinations of Portland cement conforming to BS 12 with pulverized-fuel ash conforming to BS 3892 : Part 1.

NOTE. The reason for the limit on slag or ggbs content is to ensure that the properties of the concrete within a specified designated mix are broadly similar in the normally mild or cold climate in the United Kingdom. Where differences in rate of strength gain and finishing time do not matter the purchaser may delete this requirement.

Cement Group 2

- (a) Portland pulverized-fuel ash cements conforming to BS 6588 containing not less than 26 % of fly ash by mass of the nucleus or combinations of Portland cement conforming to BS 12 with pfa conforming to BS 3892 : Part 1 where there is not more than 40 % pfa and not less than 25 % pfa by mass of the combination.
- (b) High slag blastfurnace cement conforming to BS 4246 containing not less than 74 % slag by mass of the nucleus or combinations of Portland cement conforming to BS 12 with ggbs conforming to BS 6699 where there is not less than 70 % ggbs and not more than 85 % ggbs by mass of the combination.

Where the alumina content of granulated blastfurnace slag exceeds 14 % the tricalcium aluminate (C_3A) content of the Portland cement shall not exceed 10 %.

Cement Group 3

- (a) Sulphate-resisting Portland cement conforming to BS 4027.

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Clause 16.4.4

In line 3, delete '3' and substitute '4'.

Clause 17.3 Minimum cement content

Delete the first sentence and substitute the following.

The minimum cement content for concrete made with aggregate of 20 mm nominal maximum size shall be that given in table 6 corresponding to the mix designation and cement group used.

In paragraph 1, line 7, delete 'PAV 2. In this case' and substitute 'PAV 2 and GEN 0. In these cases'.

AMD 8759/October 1995

Clause 17.5 Maximum water/cement ratio

Immediately after 'corresponds to the mix designation' insert 'and cement group used'.

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Clause 17.7 Alkali-silica reaction

In item (c), line 3, delete '1987' and substitute '1995'.

Clause 17.8 Workability

Delete the note and substitute the following.

NOTE. GEN mixes with relatively low cement contents may not always be suitable for obtaining cast and direct finished surfaces (see note 1 to **15.3**).

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Clause 18.1 Quality assurance

Paragraph 1, line 4 delete 'BS 5750 : Part 1 (EN 29001)' and substitute 'BS EN ISO 9001'.

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Appendix A. Forms for specifying or scheduling concrete mixes in accordance with BS 5328

In line 13, delete 'RHPC rapid hardening Portland cement'.

Delete forms A and D and substitute the attached.

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Form A. Schedule for the specification requirements of designed mixes required for use on contract.....					
These mixes below shall be supplied as designed mixes in accordance with the relevant clauses of BS 5328 : Parts 2, 3 and 4.					
1.	Mix reference				
2.	Strength grade				
3.	Nominal maximum size of aggregate, mm				
4.	Types of aggregate (ring those permitted)	Coarse Other Fine Other	BS 882 BS 1047 BS 882	BS 882 BS 1047 BS 882	BS 882 BS 1047 BS 882
5.	Sulphate class ¹ (if appropriate ring one)		Class 2 Class 3 Class 4A Class 4B	Class 2 Class 3 Class 4A Class 4B	Class 2 Class 3 Class 4A Class 4B
6.	Cement type(s) or combinations conforming to (ring those permitted)	BS 12 BS 146 BS 6588 BS 4027 Others	PC PBFC PPFAC SRPC	PC PBFC PPFAC SRPC	PC PBFC PPFAC SRPC
7.	Minimum cement content ² , kg/m ³				
8.	Maximum free water/cement ²				
9.	Quality assurance requirement				
10.	Rate of sampling intended by the purchaser for strength testing (for information)				
11.	Other requirements (e.g. maximum chloride, alkali, etc., only if appropriate)				
The following section to be completed by purchaser of fresh concrete only					
12.	Workability Slump, mm Compacting factor Vebe, s Flow, mm (enter method and give target)				
13.	Method of placing (for information)				
14.	Other requirements by purchaser of fresh concrete (only if appropriate)				
¹ The purchaser should ensure that the sulphate class indicated includes the modifications required by table 7c and table 7d of BS 5328 : Part 1 : 1991 where appropriate. When specifying concrete for use in sulphate bearing ground any adjustment made for acid conditions should be noted on this form. ² Where a sulphate class is ringed and no preference for a cement type is indicated, the minimum cement content and maximum free water/cement ratio for the cement type to be used should be in accordance with table 7a of BS 5328 : Part 1 : 1991.					