

Draft for Public Comment



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Project no.: 1996/06208

Responsible committee: B/517/8 Protection and Repair of Concrete
Interested committees: CB/1; B/2; B/11; B/517/3; B/517; B/525/2

Draft: prEN 13894-2
Title: **Products and Systems for the Protection and Repair of Concrete Structures-
Test methods – Determination of fatigue under dynamic loading-
Part 2: in service**

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Cross-references

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The Online Service can also be used to find information on draft standards related to international or European publications.

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No. 28, 22/05/00

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Commenting on drafts

Introduction

Your comments on this draft are welcome and will assist in the preparation of the consequent British Standard. If no comments are received to the contrary, this draft may be implemented unchanged as a British Standard.

Format

The guidance given below is intended to ensure that all comments receive efficient and appropriate attention by the responsible BSI committee. **Annotated drafts are not acceptable and will be rejected.**

Each comment shall make one point only, be clearly separated from the others and be structured as follows in clause order:

- clause/sub-clause;
- paragraph/table/figure number;
- type of comment (general, technical or editorial);
- comment (with rationale);
- proposed change.

Submission

All comments should be submitted to the committee secretary at the Head Office address, preferably electronically via e-mail or on diskette (MS-DOS compatible, 1.44 megabytes). Comments should be compatible with Version 6.0 or Version 97 of Microsoft® Word for Windows™, if possible; otherwise comments in ASCII text format are acceptable. Any comments not submitted electronically should still adhere to the format requirements given above. No acknowledgement will normally be sent.

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Table for submission of comments

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Draft no:	Project no.: 1996/06208	DPC no.: 00/103889 DC
Short title:	Commentator:	Date:

Clause/ subclause	Paragraph/ Figure/ Table	Type of comment (General/ technical/editorial)	Comment (with rationale)	Proposed change
<u>Examples:</u>				
3.1	1st definition	Editorial	Definition is ambiguous and needs clarifying.	Amend to read '... so that the mains connector to which no connection ...'
6.4	2nd paragraph	Technical	The use of the UV photometer as an alternative cannot be supported as serious problems have been encountered in its use in the UK, giving rise to misleadingly high results.	Delete reference to UV photometer.

ICS

English version

**Products and systems for the protection and repair of concrete
structures - Test methods - Determination of fatigue under
dynamic loading - Part 2: in service**

Produits et systèmes pour la protection et la réparation des
structures en béton - Méthodes d'essais - Détermination de
la fatigue sous charge dynamique - Partie 2: en service

Produkte und Systeme für den Schutz und die
Instandsetzung von Betontragwerken - Prüfverfahren -
Bestimmung der Dauerschwingfestigkeit unter dynamischer
Belastung Teil 2: Im Gebrauch

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 104.

If this draft becomes a European Standard, CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

This draft European Standard was established by CEN in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Central Secretariat has the same status as the official versions.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

Central Secretariat: rue de Stassart, 36 B-1050 Brussels

CEN TC 104 SC8 WG3**pr EN 104-852 99-12****Determination of fatigue under dynamic loading****Part 2: In Service****1) SCOPE AND FIELD OF APPLICATION**

The purpose of this standard is to define a laboratory method of testing to ascertain the response to fatigue under dynamic loading during cure of structural bonding agents in composite systems involving the bonding of steel-to-steel, steel-to-concrete and hardened concrete-to-hardened concrete.

2) REFERENCES**3) TEST METHOD**

This standard uses the slant shear test using steel prisms of size 40x40x160mm with a bond line inclined at an angle of 45 deg (Fig. 1). The test is performed by applying a dynamic tension force along the longitudinal axis of the bonded prism. The number of load cycles is raised until failure occurs.

4) EQUIPMENT

- 4.1 Steel prisms 40x40x160 mm cut at an angle of 45 deg. as shown in Fig. 1.
- 4.2 Grit blasting equipment.
- 4.3 A tension testing machine capable of applying load cycles with a frequency of 2 to 5 Hz with loads between 5 and 200 kN and a device for counting the load cycles.

5) TEST PROCEDURE**5.1 Preparation of test pieces**

The bonding surfaces of the steel prisms shall be grit blasted and degreased. The thickness of the bondline shall be 1mm. This is fixed by the 4 screws shown in Fig.1 during the hardening of the adhesive. The test components shall be stored at $(21\pm 2)^{\circ}\text{C}$ and a RH of $(60\pm 10)\%$ for at least 28 days.

5.2 Number of tests

Three prisms shall be tested by applying a constant rate of loading of 1kN per second until failure to find the short term failure load F_{um} .

The fatigue test is performed at three load stages with five test prisms each. The bottom load is 5 % of F_{um} . The three upper loads are 90 %, 75 % and 60 % of F_{um} . If more than three prisms do not fail before 10^7 load cycles, the upper load shall be raised for three additional tests.

5.3 Testing

The ends of the prisms shall be connected by screwing in steel bars. The length of these steel bars shall be at least 200 mm. The dynamic tension test shall then be carried out using the standard procedure for fatigue testing of steel bars. The number of load cycles and the failure mode shall be recorded.

5 Failure mode

Type A: cohesion failure within the adhesive

Type B: adhesion failure at one of the interfaces

Type C: adhesion failure at the other interface

If there is a mix of these failure modes make a visual assessment to determine the surface area percentage type of failure and express this as a ratio, for example-

A:B:C = 50:20:30

6) REPORT

The report shall include the following information:

- 6.1 The number of test specimens for dynamic and for short time loading
- 6.2 The properties of the steel prisms
- 6.3 The surface preparation of the steel prisms
- 6.4 Method of mixing and application of the bonding agent
- 6.5 The time between mixing and application of the bonding agent
- 6.6 The time between application of the bonding agent and closing the joint
- 6.7 Method and duration of curing the test pieces
- 6.8 The short term failure load of each prism F_u and its mean value F_{um} .
- 6.9 The bottom load and the upper load of each test in percentages of F_{um} .
- 6.10 The frequency of the load cycles
- 6.11 The number of load cycles of each test
- 6.12 The failure mode of each test specimen
- 6.13 Any deviation from this standard test procedure
- 6.14 The type and manufacturing date of the bonding agent
- 6.15 Date of the test
- 6.16 Reference to this European Standard

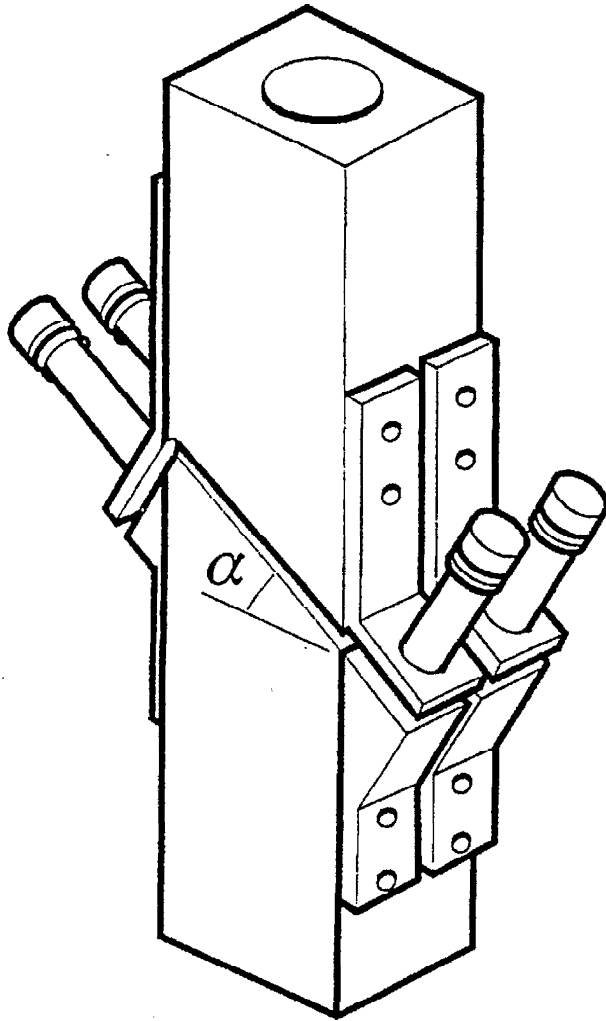


Figure 1