



SLOVENSKI STANDARD
SIST EN 14488-3:2006
01-oktober-2006

DfYg_i ýUb^YVf]n[UbY[UVYrcbUË" "XY. 'l dc[]VbUlfXbcghfifj]'j f\ ž_cb bU]b
dfYcghUULUfa]fUb] \ 'j `U_Yb`nUj ncfW'bcg]Wj

Testing sprayed concrete - Part 3: Flexural strengths (first peak, ultimate and residual) of fibre reinforced beam specimens

Prüfung von Spritzbeton - Teil 3: Biegefestigkeiten (Erstriss-, Biegezug- und Restfestigkeit) von faserverstärkten balkenförmigen Betonprüfkörpern

STANDARD PREVIEW

Essais pour béton projeté - Partie 3: Résistances à la flexion (au premier pic, ultime et résiduelle) d'éprouvettes parallélépipédiques en béton renforcé par des fibres

[SIST EN 14488-3:2006](https://standards.iteh.ai/catalog/standards/sist/9efabfd-68a4-45d8-b2b2-1759cd0c1547/sist-en-14488-3-2006)

Ta slovenski standard je istoveten z: [EN 14488-3:2006](https://standards.iteh.ai/catalog/standards/sist/9efabfd-68a4-45d8-b2b2-1759cd0c1547/sist-en-14488-3-2006)

ICS:

91.100.30 Beton in betonski izdelki Concrete and concrete products

SIST EN 14488-3:2006

en

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN 14488-3:2006

<https://standards.iteh.ai/catalog/standards/sist/9efabfdd-68a4-45d8-b2b2-f759ed8e1547/sist-en-14488-3-2006>

ICS 91.100.30

English Version

Testing sprayed concrete - Part 3: Flexural strengths (first peak, ultimate and residual) of fibre reinforced beam specimens

Essais pour béton projeté - Partie 3 : Résistances à la flexion (au premier pic, ultime et résiduelle) d'éprouvettes parallélépipédiques en béton renforcé par des fibres

Prüfung von Spritzbeton - Teil 3: Biegefestigkeiten (Erstriss-, Biegezug- und Restfestigkeit) faserverstärkten balkenförmigen Betonprüfkörpern

This European Standard was approved by CEN on 27 February 2006.

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. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

This European Standard exists 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.

CEN members are the national standards bodies of Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

[SIST EN 14488-3:2006](https://standards.iteh.ai/catalog/standards/sist/9efabfdd-68a4-45d8-b2b2-f759ed8e1547/sist-en-14488-3-2006)

<https://standards.iteh.ai/catalog/standards/sist/9efabfdd-68a4-45d8-b2b2-f759ed8e1547/sist-en-14488-3-2006>



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

Management Centre: rue de Stassart, 36 B-1050 Brussels

Contents

Page

Foreword.....	3
1 Scope	4
2 Normative references	4
3 Principle	4
4 Apparatus	4
4.1 Testing machine.....	4
4.2 Force application	5
4.3 Deflection measurement and control	6
5 Test specimen	7
5.1 General.....	7
5.2 Adjustment of test specimens.....	7
6 Procedures	8
6.1 Preparation and positioning of specimens	8
6.2 Loading	8
7 Expression of results	8
7.1 First peak and ultimate flexural strengths	8
7.2 Residual flexural strengths.....	10
8 Test report	10
9 Accuracy.....	11
Bibliography.....	12

iTeh STANDARD PREVIEW
 (standards.iteh.ai)
 SIST EN 14488-3:2006
<https://standards.iteh.ai/catalog/standards/sist/9efabfd-68a4-45d8-b2b2-1759ed8c1547/sist-en-14488-3-2006>

Foreword

This European Standard (EN 14488-3:2006) has been prepared by Technical Committee CEN/TC 104 "Concrete and related products", the secretariat of which is held by DIN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by October 2006, and conflicting national standards shall be withdrawn at the latest by December 2007.

This European Standard is part of a series concerned with testing sprayed concrete.

This series EN 14488 Testing sprayed concrete includes the following parts:

- Part 1: Sampling fresh and hardened concrete
- Part 2: Compressive strength of young sprayed concrete
- Part 3: Flexural strengths (first peak, ultimate and residual) of fibre reinforced beam specimens
- Part 4: Bond strength of cores by direct tension
- Part 5: Determination of energy absorption capacity of fibre reinforced slab specimens
- Part 6: Thickness of concrete on a substrate
- Part 7: Fibre content of fibre reinforced concrete

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

1 Scope

This part of European Standard specifies a method for the determination of the flexural (first peak, ultimate and residual) strength of beam specimens of hardened sprayed concrete.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 12390-1:2000, *Testing hardened concrete — Part 1: Shape, dimensions and other requirements for specimens and moulds*

EN 12390-4:2000, *Testing hardened concrete — Part 4: Compressive strength — Specification for testing machines*

EN 14487-1, *Sprayed concrete — Part 1: Definitions, specifications and conformity*

EN 14488-1, *Testing sprayed concrete — Part 1: Sampling fresh and hardened concrete*

3 Principle

Prismatic beam specimens are subject to a bending moment by the application of load through upper and lower rollers. The first peak, maximum and residual loads sustained are recorded and the corresponding flexural strengths calculated.

A fibre reinforced prism specimen, sawn from a test panel in accordance with EN 14488-1 is subject to a bending moment by the application of load through upper and lower rollers under deflection control to obtain its load/deflection response (the latter exclusive of non-bending deformations). The first peak, ultimate and residual flexural strengths are determined from the load/deflection curve.

4 Apparatus

4.1 Testing machine

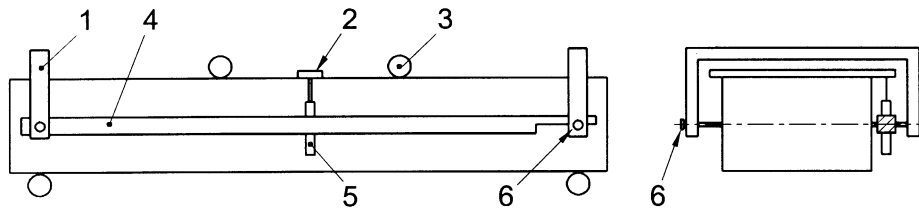
The test shall be carried out using a testing machine conforming to 4.2 and 4.3 of EN 12390-4:2000.

The stiffness and control system of the testing machine shall be such that the test can be deflection controlled. The stiffness of the load system (including frame, load cell, loading block and support frame) shall be at least 200 kN/mm.

A steel or aluminium yoke (Figure 1).

A calibrated electronic transducer with a resolution of at least 0,02 mm.

An electronic data logger or XY plotter.



Key

- 1 Cramp
- 2 Reference bar (clamped or glued)
- 3 Loading roller
- 4 Yoke
- 5 Transducer
- 6 Locating screw

NOTE A yoke/transducer may be fixed at each side of the beam, instead of at only one as it is represented in the section of the beam.

Figure 1 — Arrangement of yoke for bending deflection measurement

4.2 Force application

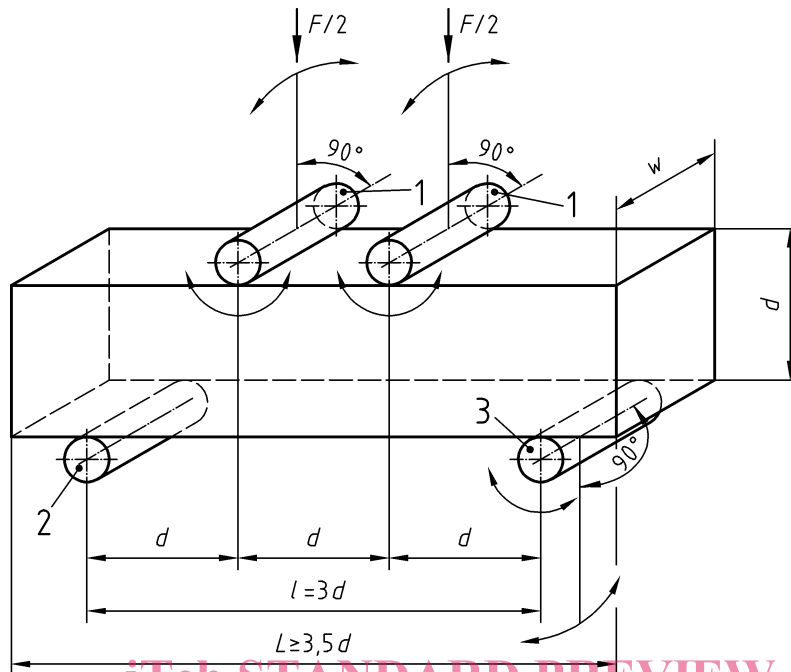
The device for applying loads (see Figure 2) shall consist of:

- two supporting rollers;
- two upper rollers carried by an articulated cross member, which divides the load applied by the machine equally between the two rollers.

All rollers shall be manufactured from steel and shall have a circular cross-section with a diameter of 20 mm to 40 mm. They shall be at least 10 mm longer than the width of the test specimen.

Three rollers, including the two upper ones, shall be capable of rotating freely around their axes and of being inclined in a plane normal to the longitudinal axis of the test specimen.

The distance, l , between the outer rollers (i.e. the span) shall be equal to $3d$, where d is 150 mm. The distance between the inner rollers shall be equal to d . The inner rollers shall be equally spaced between the outer rollers as shown in Figure 2. All rollers shall be adjusted to the positions illustrated in Figure 2 to an accuracy of $\pm 2,0$ mm.



iTeh STANDARD PREVIEW
(standards.iteh.ai)

Key

- 1 Loading roller (capable of rotation and of being inclined)
 - 2 Supporting roller
 - 3 Supporting roller (capable of rotation and of being inclined)
- F is the load (P_{fp} or P_{ult}) defined above in newtons
 l is the span
 w is the average beam width
 d is the beam height
 L is the beam length

Figure 2 — Arrangement of loading of test specimen

4.3 Deflection measurement and control

Bending deflection, excluding any support deformations and twist, shall be measured by means of an electronic transducer mounted at mid-span to a yoke that is held to the beam at mid-height of the beam (the neutral axis) and directly over the supports. A suitable yoke arrangement is shown in Figure 1. It is preferable to use two transducers, one mounted on each side of the beam.

The testing machine shall be controlled from the transducer in order to load the specimen at a constant rate of deflection at the midspan of the beam. The load-deflection curve shall be continuously recorded or logged. Where two transducers are used the average midspan deflection shall be determined.

5 Test specimen

5.1 General

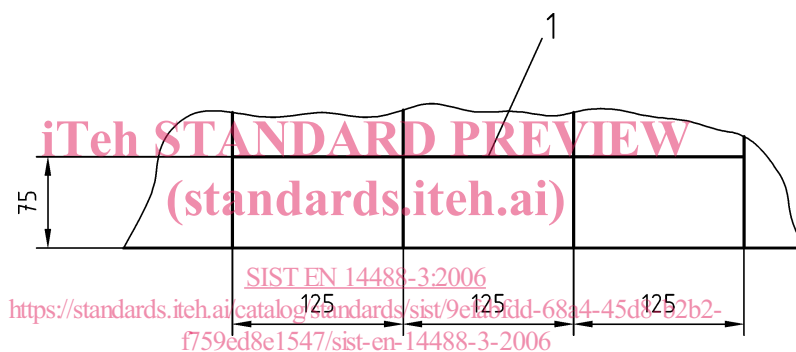
Each test specimen shall be a sawn prism with dimensions of 75 mm depth × 125 mm width and a length of at least 500 mm length cut from a sprayed panel as shown in Figure 3 and prepared to meet the requirements of EN 12390-1. The bottom uncut mould face shall be identified on the specimen (indicating the direction of spraying).

Beams shall be tested with the bottom uncut moulded face in tension, unless otherwise specified. If the top face of the beam is to be put in tension it shall not be sawn (to avoid cutting end anchorages of the steel fibres).

The prisms should be stored in water at $(20 \pm 2)^\circ\text{C}$ for a minimum of 3 days after sawing until no more than 3 hours before testing (leaving sufficient time for preparation including the attachment of any location devices for the yoke or transducer).

Testing shall normally be performed at 28 days.

The specimens shall be examined and any abnormalities observed shall be reported.



Key

- 1 Top of beam

Figure 3 — Cutting arrangement for beams

5.2 Adjustment of test specimens

Where the dimensions or shapes of test specimens do not conform to 4.3 of EN 12390-1:2000 because they exceed the respective tolerances, they shall be rejected or adjusted as follows:

- uneven surfaces shall be levelled by grinding;
- the deviation of angles shall be corrected by cutting and/or grinding.

NOTE The tolerances specified in EN 12390-3 will usually be too demanding for specimens sawn from sprayed concrete test panels and should normally be relaxed by prior agreement of the parties.