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FprEN 14488-3

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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) von faserverstärkten balkenförmigen Betonprüfkörpern

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

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

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

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European foreword

This document (FprEN 14488-3:2022) has been prepared by Technical Committee CEN/TC 104 "Concrete and related products", the secretariat of which is held by SN.

This document is currently submitted to the Formal Vote.

This document will supersede EN 14488-3:2006.

This document 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 residual 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*

Introduction

Classification of residual flexural strength of fibre reinforced sprayed concrete is made by specification of a strength level at a certain deformation range.

This could be done using the four-point bending test described in method A or using the three point bending test on square notched panel described in method B of this document.

Methods A and B can be used for metallic fibres, synthetic or other fibres, or a combination of fibre types.

1 Scope

This document specifies methods (method A and B) for the determination of the first peak, ultimate and residual strength of specimens of hardened sprayed concrete.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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, *Testing hardened concrete - Part 1: Shape, dimensions and other requirements for specimens and moulds*

EN 12390-2, *Testing hardened concrete - Part 2: Making and curing specimens for strength tests*

EN 12390-4, *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 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— IEC Electropedia: available at https://www.electropedia.org/

— ISO Online browsing platform: available at https://www.iso.org/obp/

3.1
crack mouth opening displacement
linear displacement measured by a transducer installed on a specimen subjected to a central line load *F*

3.2
deflection
linear displacement measured by a transducer installed on a specimen subjected to a central line load *F*

3.3
limit of proportionality
stress at the tip of the notch which is assumed to be exerted, in the case of a linear stress distribution, in an uncracked section at mid-span of a prism subjected to a centred load F_L (method A) or F_{L_S} (method B)

3.4
residual flexural tensile strength according to method A
residual strength on the beam calculated from the minimum load on the flexural stress/deflection curve between 0,5 mm and 1 mm, 2mm and 4 mm

3.5
residual flexural tensile strength according to method B
fictitious stress at the tip of the notch which is assumed to act in an uncracked mid-span section, with linear stress distribution, of a plate subjected to the central line load F_j corresponding to $CMOD_j$ where $CMOD_j > CMOD_{F_L}$ or to δ_j where $\delta_j > \delta_{F_L}$ (j = 1,2,3,4)

4 Symbols and abbreviated terms

4.1 Symbols

$CMOD_{F_{Ls}}$	CMOD at LOP
$CMOD_{js}$	value of CMOD, j = 1, 2, 3 or 4
F	load
F_{js}	load value, j = 1, 2, 3 or 4
F_L	load at LOP (according to method A)
F_{L_s}	load at LOP (according to method B)
L	length of test specimen
M	bending moment
M_{j_s}	bending moment value, j = 1, 2, 3 or 4
M_{L_s}	bending moment corresponding to the load at LOP
b	width of test specimen
$f_{R,j}$	residual flexural strengths determined from sawn beams according to method A, where j = 1, 2 or 4
$f_{R,js}$	residual flexural tensile strengths determined from panels according to method B, where j = 1, 2, 3 or 4
$f^{f}_{ct,Ls}$	LOP
F_{fp}	first peak load
F_{ult}	maximum load
h_{sp}	distance between the tip of the notch and the top of the test specimen in the mid-span section
l	length of span
x	width of notch
y	distance between bottom of test specimen and axis of displacement transducer
δ	deflection
$\delta_{F_{Ls}}$	deflection at LOP
δ_{js}	deflection value, j = 1, 2, 3 or 4

4.2 Abbreviations

CMOD	crack mouth opening displacement
LOP	limit of proportionality