

Natural stone test methods — Determination of flexural strength under constant moment

The European Standard EN 13161:2001 has the status of a
British Standard

ICS 91.100.15

National foreword

This British Standard is the official English language version of EN 13161:2001, including Corrigendum July 2002.

The UK participation in its preparation was entrusted to Technical Committee B/454, Natural stone, which has the responsibility to:

- aid enquirers to understand the text;
- present to the responsible international/European committee any enquiries on the interpretation, or proposals for change, and keep UK interests informed;
- monitor related international and European developments and promulgate them in the UK.

A list of organizations represented on this committee can be obtained on request to its secretary.

Cross-references

The British Standards which implement international or European publications referred to in this document may be found in the *BSI Catalogue* under the section entitled “International Standards Correspondence Index”, or by using the “Search” facility of the *BSI Electronic Catalogue* or of British Standards Online.

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This British Standard, having been prepared under the direction of the Building and Civil Engineering Sector Policy and Strategy Committee, was published under the authority of the Standards Policy and Strategy Committee on 22 March 2002

Summary of pages

This document comprises a front cover, an inside front cover, the EN title page, pages 2 to 14, an inside back cover and a back cover.

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Amendments issued since publication

Amd. No.	Date	Comments
16214 Corrigendum No. 1	30 June 2006	The logarithmic standard deviation in A.2 has been replaced

English version

Natural stone test methods - Determination of flexural strength under constant moment

Méthodes d'essai pour pierres naturelles - Détermination
de la résistance en flexion sous moment constant

Prüfverfahren für Naturstein - Bestimmung der
Biegefestigkeit unter Drittlinienlast

This European Standard was approved by CEN on 29 September 2001.

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 Management Centre 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 Management Centre has the same status as the official versions.

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Foreword

This European Standard has been prepared by TC 246 "Natural Stone", the secretariat of which is held by UNI.

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 April 2002, and conflicting national standards shall be withdrawn at the latest by December 2002.

This draft standard is one of the series of draft standards for tests on natural stone.
Test methods for natural stone consist of the following parts:

EN 1925	<i>Natural stone test methods – Determination of water absorption coefficient by capillarity.</i>
EN 1926	<i>Natural stone test methods – Determination of compressive strength.</i>
EN 1936	<i>Natural stone test methods – Determination of real density and apparent density and of total porosity and open porosity.</i>
EN 12370	<i>Natural stone test methods – Determination of resistance to salt crystallisation.</i>
EN 12372	<i>Natural stone test methods – Determination of flexural strength under concentrated load.</i>
prEN 12371	<i>Natural stone test methods – Determination of frost resistance.</i>
prEN 12407	<i>Natural stone test methods – Petrographic description.</i>
prEN 13364	<i>Natural stone test methods – Determination of the breaking load at a dowel hole.</i>
prEN 13373	<i>Natural stone test methods – Determination of geometric characteristics.</i>
prEN 13755	<i>Natural stone test methods – Determination of water absorption at atmospheric pressure.</i>
prEN 13919	<i>Natural stone test methods – Determination of resistance to ageing by SO₂ action in the presence of humidity.</i>
prEN 14066	<i>Natural stone test methods – Determination of thermal shock resistance.</i>
prEN 14147	<i>Natural stone test methods – Determination of resistance to ageing by salt mist.</i>
prEN 14157	<i>Natural stone test methods – Determination of abrasion resistance.</i>
prEN 14158	<i>Natural stone test methods – Determination of rupture energy.</i>
prEN ...(WI 00246011)	<i>Natural stone test methods – Determination of thermal dilatation coefficient.</i>
prEN ...(WI 00246012)	<i>Natural stone test methods – Determination of sound – speed propagation.</i>
prEN ...(WI 00246015)	<i>Natural stone test methods – Determination of Knoop hardness.</i>
prEN ...(WI 00246017)	<i>Natural stone test methods – Determination of slip coefficient.</i>
prEN ...(WI 00246018)	<i>Natural stone test methods – Determination of static elastic modulus.</i>
prEN ...(WI 00246030)	<i>Natural stone test methods – Determination of surface finishes (rugosity).</i>

It is intended that other European Standards should call up this European Standard as the basis of evaluation of conformity.

NOTE Nevertheless it is not intended that all natural stones products should be subjected regularly to all the listed tests. Specifications in other standards should call up only relevant test methods.

The Annex A contained in this European Standard is normative.

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

1 Scope

This European Standard specifies a method to determine the flexural strength of natural stones under constant moment. The standard contains provision for both an identification test and for a technological test.

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text, and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

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

EN 12390-5 *Testing hardened concrete - Part 5: Flexural strength of test specimens.*

3 Principle

After appropriate preparation a specimen of the rock to be tested is laid and centred between two supports. Thereafter the specimen is subjected to two line loads acting on the top of the specimen and so that each load is located at a distance of one third of the length of span. The loads are steadily increased until failure.

4 Symbols

R_{tc}	flexural strength at constant moment, in Megapascal
F	load at failure in newton
B	specimen width in millimetres
h	specimen thickness in millimetres
L	specimen length in millimetres
ℓ	distance between the supporting rollers, in millimetres