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Timber structures - Structural timber and glued laminated timber - Determination of some physical and mechanical properties CONSOLIDATED TEXT

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 408:2010+A1

July 2012

ICS 91.080.20; 79.040; 79.060.99

English Version

Timber structures - Structural timber and glued laminated timber - Determination of some physical and mechanical properties

Structures en bois - Bois de structure et bois lamellé-collé - Détermination de certaines propriétés physiques et mécaniques

Holzbauwerke - Bauholz für tragende Zwecke und Brettschichtholz - Bestimmung einiger physikalischer und mechanischer Eigenschaften

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Foreword

This document (EN 408:2010+A1:2012) has been prepared by Technical Committee CEN/TC 124 “Timber structures”, the secretariat of which is held by AFNOR.

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of an identical text or by endorsement, at the latest by January 2013, and conflicting national standards shall be withdrawn at the latest by January 2013.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document includes Amendment 1 approved by CEN on 16 June 2012.

The start and finish of text introduced or altered by amendment is indicated in the text by tags ⟦A1⟩ ⟨A1⟧.

This document supersedes ⟦A1⟩ EN 408:2010. ⟨A1⟧

In this revised standard a new test is added for the determination of the shear modulus.

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

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Introduction

This 2010 revision replaces the test for the determination of the shear strength parallel to grain.

The revised edition of 2003 added a global bending modulus of elasticity, whilst renaming the existing test as the local modulus of elasticity. It also includes the methods for determination of shear strength and mechanical properties perpendicular to the grain, previously given in EN 1193, which has now been withdrawn.

The values obtained in any determination of the properties of timber depend upon the test methods used. It is therefore desirable that these methods be standardized so that results from different test centres can be correlated. Moreover, with the adoption of limit state design and with the development of both visual and machine stress grading, attention will be increasingly centred on the determination and monitoring of the strength properties and variability of timber in structural sizes. Again, this can be more effectively undertaken if the basic data are defined and obtained under the same conditions.

This European Standard, which is based originally on ISO 8375, specifies laboratory methods for the determination of some physical and mechanical properties of timber in structural sizes. The methods are not intended for the grading of timber or for quality control.

For the determination of shear modulus, alternative methods have been specified. The choice of which to use will depend upon the objective of the investigation and, to some extent, on the equipment available. Following testing to this standard it is intended that the determination of characteristic values will normally be obtained according to procedures specified in other European Standards.

Attention is drawn to the advantages that may be gained, often with little extra effort, in extending the usefulness of test results by recording additional information on the growth characteristics of the pieces that are tested, particularly at the fracture sections. Generally, such additional information should include grade-determining features such as knots, slope of grain, rate of growth, wane, etc., on which visual grading rules are based, and strength indicating parameters such as localized modulus of elasticity, on which some machine stress grading is based.

1 Scope

This European Standard specifies test methods for determining the following properties of structural timber and glued laminated timber: modulus of elasticity in bending; shear modulus; bending strength; modulus of elasticity in tension parallel to the grain; tension strength parallel to the grain; modulus of elasticity in compression parallel to the grain; compression strength parallel to the grain; modulus of elasticity in tension perpendicular to the grain; tension strength perpendicular to the grain; modulus of elasticity in compression perpendicular to the grain; compression strength perpendicular to the grain and shear strength.

In addition, the determination of dimensions, moisture content, and density of test pieces are specified.

The methods apply to rectangular and circular shapes (of substantially constant cross section) of solid unjointed timber or finger-jointed timber and glued laminated timber unless stated otherwise.

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.

〚A1〛 EN 384:2010, *Structural timber — Determination of characteristic values of mechanical properties and density* 〚A1〛

EN 13183-1, *Moisture content of a piece of sawn timber — Part 1: Determination by oven dry method*

3 Terms and definitions

Not applicable.

4 Symbols and abbreviations

A	cross-sectional area, in square millimetres;
a	distance between a loading position and the nearest support in a bending test, in millimetres;
b	width of cross section in a bending test, or the smaller dimension of the cross section, in millimetres;
$E_{c,0}$	modulus of elasticity in compression parallel to the grain, in newtons per square millimetre;
$E_{c,90}$	modulus of elasticity in compression perpendicular to the grain, in newtons per square millimetre;
$E_{m,g}$	global modulus of elasticity in bending, in newtons per square millimetre;
$E_{m,l}$	local modulus of elasticity in bending, in newtons per square millimetre;
$E_{t,0}$	modulus of elasticity in tension parallel to the grain, in newtons per square millimetre;
$E_{t,90}$	modulus of elasticity in tension perpendicular to the grain, in newtons per square millimetre;
F	load, in newtons;
$F_{c,90}$	compressive load perpendicular to the grain, in newtons;
$F_{c,90,max}$	maximum compressive load perpendicular to the grain, in newtons;
$F_{c,90,max,est}$	estimated maximum compressive load perpendicular to the grain, in newtons;

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