SVENSK STANDARD
SS-EN 408:2010+A1:2012

Fastställd/Approved: 2012-07-30
Publicerad/Published: 2012-08-30
Utgåva/Edition: 1
Språk/Language: engelska/English
ICS: 79.040; 79.060.99; 91.080.20

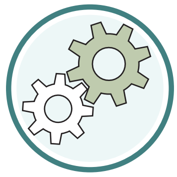
Träkonstruktioner – Konstruktionsvirke och limträ – Bestämning av vissa fysikaliska och mekaniska egenskaper

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

Standarder får världen att fungera

SIS (Swedish Standards Institute) är en fristående ideell förening med medlemmar från både privat och offentlig sektor. Vi är en del av det europeiska och globala nätverk som utarbetar internationella standarder. Standarder är dokumenterad kunskap utvecklad av framstående aktörer inom industri, näringsliv och samhälle och befrämjar handel över gränser, bidrar till att processer och produkter blir säkrare samt effektiviserar din verksamhet.

Delta och påverka
Som medlem i SIS har du möjlighet att påverka framtida standarder inom ditt område på nationell, europeisk och global nivå. Du får samtidigt tillgång till tidig information om utvecklingen inom din bransch.



Ta del av det färdiga arbetet
Vi erbjuder våra kunder allt som rör standarder och deras tillämpning. Hos oss kan du köpa alla publikationer du behöver – allt från enskilda standarder, tekniska rapporter och standard-paket till handböcker och onlinetjänster. Genom vår webbtjänst e-nav får du tillgång till ett lättnavigerat bibliotek där alla standarder som är aktuella för ditt företag finns tillgängliga. Standarder och handböcker är källor till kunskap. Vi säljer dem.

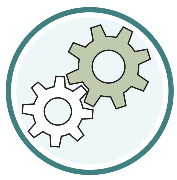
Utveckla din kompetens och lyckas bättre i ditt arbete
Hos SIS kan du gå öppna eller företagsinterna utbildningar kring innehåll och tillämpning av standarder. Genom vår närhet till den internationella utvecklingen och ISO får du rätt kunskap i rätt tid, direkt från källan. Med vår kunskap om standarders möjligheter hjälper vi våra kunder att skapa verklig nytta och lönsamhet i sina verksamheter.

Vill du veta mer om SIS eller hur standarder kan effektivisera din verksamhet är du välkommen in på www.sis.se eller ta kontakt med oss på tel 08-555 523 00.

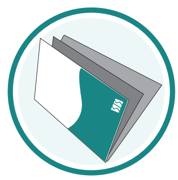
Standards make the world go round

SIS (Swedish Standards Institute) is an independent non-profit organisation with members from both the private and public sectors. We are part of the European and global network that draws up international standards. Standards consist of documented knowledge developed by prominent actors within the industry, business world and society. They promote cross-border trade, they help to make processes and products safer and they streamline your organisation.

Take part and have influence
As a member of SIS you will have the possibility to participate in standardization activities on national, European and global level. The membership in SIS will give you the opportunity to influence future standards and gain access to early stage information about developments within your field.



Get to know the finished work
We offer our customers everything in connection with standards and their application. You can purchase all the publications you need from us - everything from individual standards, technical reports and standard packages through to manuals and online services. Our web service e-nav gives you access to an easy-to-navigate library where all standards that are relevant to your company are available. Standards and manuals are sources of knowledge. We sell them.



Increase understanding and improve perception
With SIS you can undergo either shared or in-house training in the content and application of standards. Thanks to our proximity to international development and ISO you receive the right knowledge at the right time, direct from the source. With our knowledge about the potential of standards, we assist our customers in creating tangible benefit and profitability in their organisations.

If you want to know more about SIS, or how standards can streamline your organisation, please visit www.sis.se or contact us on phone +46 (0)8-555 523 00

Europastandarden EN 408:2010+A1:2012 gäller som svensk standard. Detta dokument innehåller den officiella engelska versionen av EN 408:2010+A1:2012.

Denna standard ersätter SS-EN 408:2010, utgåva 3.

The European Standard EN 408:2010+A1:2012 has the status of a Swedish Standard. This document contains the official version of EN 408:2010+A1:2012.

This standard supersedes the Swedish Standard SS-EN 408:2010, edition 3.

Upplysningar om sakinnehållet i standarden lämnas av SIS, Swedish Standards Institute, telefon 08-555 520 00. Standarder kan beställas hos SIS Förlag AB som även lämnar allmänna upplysningar om svensk och utländsk standard.

Information about the content of the standard is available from the Swedish Standards Institute (SIS), telephone +46 8 555 520 00. Standards may be ordered from SIS Förlag AB, who can also provide general information about Swedish and foreign standards.

Denna standard är framtagen av kommittén för Bärande träkonstruktioner, SIS/TK 182/AG 4.

Har du synpunkter på innehållet i den här standarden, vill du delta i ett kommande revideringsarbete eller vara med och ta fram andra standarder inom området? Gå in på www.sis.se - där hittar du mer information.

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

This European Standard was approved by CEN on 16 June 2012.

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 CEN-CENELEC 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 CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of 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 United Kingdom.

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

Management Centre: Avenue Marnix 17, B-1000 Brussels

Ref. No. EN 408:2010+A1:2012: E

Contents

Page

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.

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;

F_{max}	maximum load, in newtons;
$F_{max,est}$	estimated maximum load, in newtons;
$F_{t,90}$	tensile load perpendicular to the grain, in newtons;
$F_{t,90,max}$	maximum tensile load perpendicular to the grain, in newtons;
G	shear modulus, in newtons per square millimetre;
S	first moment of area, in millimetres to the third power;
$f_{c,0}$	compressive strength parallel to the grain, in newtons per square millimetre;
$f_{c,90}$	compressive strength perpendicular to the grain, in newtons per square millimetre;
f_m	bending strength, in newtons per square millimetre;
$f_{t,0}$	tensile strength parallel to the grain, in newtons per square millimetre;
$f_{t,90}$	tensile strength perpendicular to the grain, in newtons per square millimetre;
f_v	shear strength parallel to the grain, in newtons per square millimetre;
$f_{v,k}$	characteristic shear strength parallel to the grain, in newtons per square millimetre;
G	shear modulus, in newtons per square millimetre;
$G_{tor,t}$	shear modulus in torsion, in newtons per square millimetre;
$G_{tor,s}$	shear modulus in shear field, in newtons per square millimetre;
h	depth of cross section in a bending test, or the larger dimension of the cross section, or the test piece height in perpendicular to grain and shear tests, in millimetres;
h_0	gauge length, in millimetres;
I	second moment of area, in millimetres to the fourth power;
K, k	coefficients;
k_G	coefficient for shear modulus;
k_{tor}	torque stiffness, in newton metres per radian;
k_s	shear stiffness;
ℓ	span in bending, or length of test piece between the testing machine grips in compression and tension, in millimetres;
ℓ_1	gauge length for the determination of modulus of elasticity or shear modulus, in millimetres;
ℓ_2	distance between the supports and gauge length in torsion, in millimetres;
t	plate thickness, in millimetres;
T_r	torque, in newton millimetres;