



**NSAI**  
Standards

Irish Standard  
I.S. EN 338:2016

## Structural timber - Strength classes

**I.S. EN 338:2016**

*Incorporating amendments/corrigenda/National Annexes issued since publication:*

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## National Foreword

I.S. EN 338:2016 is the adopted Irish version of the European Document EN 338:2016, Structural timber - Strength classes

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EUROPEAN STANDARD

EN 338

NORME EUROPÉENNE

EUROPÄISCHE NORM

April 2016

ICS 79.040

Supersedes EN 338:2009

English Version

## Structural timber - Strength classes

Bois de structure - Classes de résistance

Bauholz für tragende Zwecke - Festigkeitsklassen

This European Standard was approved by CEN on 30 January 2016.

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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.

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## Content

	Page
European foreword.....	3
Introduction .....	4
1 Scope.....	5
2 Normative references.....	5
3 Terms and definitions .....	5
4 Symbols and abbreviations .....	5
5 Classification of structural timber .....	6
6 Allocation of a population to a strength class.....	10
6.1 Grading.....	10
6.1.1 Visual graded timber .....	10
6.1.2 Machine graded timber.....	10
6.2 Classification.....	10
6.2.1 Characteristic values.....	10
6.2.2 Allocation to a strength class .....	10
Bibliography.....	11

## European foreword

This document (EN 338:2016) 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of an identical text or by endorsement, at the latest by October 2016, and conflicting national standards shall be withdrawn at the latest by October 2016.

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 supersedes EN 338:2009.

Compared to EN 338:2009, the following modifications have been made:

- new table of strength classes for softwood species based on tension tests;
- extension with new classes in the table of strength classes for hardwood species based on edgewise bending tests;
- modification of some characteristic values for strength, stiffness and density;
- equations to determine the characteristic values of other strength properties from the grade determining properties has been transferred to EN 384.

According to the CEN/CENELEC Internal Regulations, the national standards organizations 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.

**EN 338:2016 (E)**

## **Introduction**

A strength class system groups together grades, species and sources with similar strength properties thus making them interchangeable. This then permits an engineer to specify a chosen strength class and use the characteristic strength values of that class in design calculations.

## 1 Scope

This European Standard establishes a system of strength classes for general use in design codes.

It gives characteristic strength and stiffness properties and density values for each class to which EN 14081-1 refers.

This standard is applicable to all softwood and hardwood timber for structural use, within the scope of EN 14081-1.

## 2 Normative references

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

EN 384, *Structural timber — Determination of characteristic values of mechanical properties and density*

EN 14081 (all parts), *Timber structures — Strength graded structural timber with rectangular cross section*

## 3 Terms and definitions

For the purposes of this document, the following term and definition apply.

### 3.1

#### population

timber of one species or species combination and one source for which the strength, stiffness and density properties apply

## 4 Symbols and abbreviations

$E_{m,0,\text{mean}}$	mean characteristic value of modulus of elasticity in bending parallel to grain (in $\text{kN/mm}^2$ );
$E_{t,0,\text{mean}}$	mean characteristic value of modulus of elasticity in tension parallel to grain (in $\text{kN/mm}^2$ );
$E_{m,0,k}$	5-percentile characteristic value of modulus of elasticity in bending parallel to grain (in $\text{kN/mm}^2$ );
$E_{t,0,k}$	5-percentile characteristic value of modulus of elasticity in tension parallel to grain (in $\text{kN/mm}^2$ );
$E_{m,90,\text{mean}}$	mean characteristic value of modulus of elasticity in bending perpendicular to grain (in $\text{kN/mm}^2$ );
$E_{t,90,\text{mean}}$	mean characteristic value of modulus of elasticity in tension perpendicular to grain (in $\text{kN/mm}^2$ );
$f_{c,0,k}$	5-percentile characteristic value of compressive strength parallel to grain (in $\text{N/mm}^2$ );
$f_{c,90,k}$	5-percentile characteristic value of compressive strength perpendicular to grain (in $\text{N/mm}^2$ );
$f_{m,k}$	5-percentile characteristic value of bending strength (in $\text{N/mm}^2$ );
$f_{t,0,k}$	5-percentile characteristic value of tensile strength parallel to grain (in $\text{N/mm}^2$ );
$f_{t,90,k}$	5-percentile characteristic value of tensile strength perpendicular to grain (in $\text{N/mm}^2$ );
$f_{v,k}$	5-percentile characteristic value of shear strength (in $\text{N/mm}^2$ );

**EN 338:2016 (E)**

$G_{\text{mean}}$	mean characteristic value of shear modulus (in kN/mm <sup>2</sup> );
$\rho_k$	5-percentile characteristic value of density (in kg/m <sup>3</sup> );
$\rho_{\text{mean}}$	mean characteristic value of density (in kg/m <sup>3</sup> )

**5 Classification of structural timber**

This standard provides for a number of strength classes, each designated by a number indicating the value of the edgewise bending or tension strength in N/mm<sup>2</sup>.

For softwood species based on edgewise bending tests, the characteristic values of strength, stiffness and density for the strength classes Cxx, where xx refers to the 5-percentile characteristic bending strength value, are given in Table 1.

For softwood species based on tension tests, the characteristic values of strength, stiffness and density for the strength classes Txx, where xx refers to the 5-percentile characteristic tension strength value, are given in Table 2.

NOTE 1 Timber belonging to T classes is mainly intended for glulam and other cases where tension is the dominating load.

NOTE 2 The T classes correspond to classes L, LS or LD as in EN 14081-4 with some differences in tabulated properties and is also referred to in EN 14080.

For hardwood species based on edgewise bending tests, the characteristic values of strength, stiffness and density for the strength classes Dxx, where xx refers to the 5-percentile characteristic bending strength value, are given in Table 3.

NOTE 3 C and T classes may also be used for hardwoods with similar strength and density profiles such as e.g. poplar or chestnut.

The most common used strength classes in Europe are printed in bold.

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