

PUITKONSTRUKTSIOONID. NELINURKSE RISTLÕIKEGA
TUGEVISSORDITUD EHITUSPUIT. OSA 1: ÜLDNÕUDED

Timber structures - Strength graded structural timber
with rectangular cross section - Part 1: General
requirements

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

See Eesti standard EVS-EN 14081-1:2016 sisaldab Euroopa standardi EN 14081-1:2016 ingliskeelset teksti.	This Estonian standard EVS-EN 14081-1:2016 consists of the English text of the European standard EN 14081-1:2016.
Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas	This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation.
Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 10.02.2016.	Date of Availability of the European standard is 10.02.2016.
Standard on kättesaadav Eesti Standardikeskusest.	The standard is available from the Estonian Centre for Standardisation.

Tagasisidet standardi sisu kohta on võimalik edastada, kasutades EVS-i veebilehel asuvat tagasiside vormi või saates e-kirja meiliaadressile standardiosakond@evs.ee.

ICS 79.040

Standardite reprodutseerimise ja levitamise õigus kuulub Eesti Standardikeskusele

Andmete paljundamine, taastekitamine, kopeerimine, salvestamine elektroonsesse süsteemi või edastamine ükskõik millises vormis või millisel teel ilma Eesti Standardikeskuse kirjaliku loata on keelatud.

Kui Teil on küsimusi standardite autorikaitse kohta, võtke palun ühendust Eesti Standardikeskusega:

Aru 10, 10317 Tallinn, Eesti; koduleht www.evs.ee; telefon 605 5050; e-post info@evs.ee

The right to reproduce and distribute standards belongs to the Estonian Centre for Standardisation

No part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying, without a written permission from the Estonian Centre for Standardisation.

If you have any questions about copyright, please contact Estonian Centre for Standardisation:

Aru 10, 10317 Tallinn, Estonia; homepage www.evs.ee; phone +372 605 5050; e-mail info@evs.ee

EUROPEAN STANDARD

EN 14081-1

NORME EUROPÉENNE

EUROPÄISCHE NORM

February 2016

ICS 79.040

Supersedes EN 14081-1:2005+A1:2011, EN 14081-4:2009

English Version

Timber structures - Strength graded structural timber with rectangular cross section - Part 1: General requirements

Structures en bois - Bois de structure à section
rectangulaire classé pour sa résistance - Partie 1 :
Exigences générales

Holzbauwerke - Nach Festigkeit sortiertes Bauholz für
tragende zwecke mit rechteckigem Querschnitt - Teil 1:
Allgemeine Anforderungen

This European Standard was approved by CEN on 13 February 2016.

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

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

Contents	Page
European foreword.....	4
Introduction	5
1 Scope.....	6
2 Normative references.....	6
3 Terms and definitions	7
4 Symbols.....	8
5 Requirements for structural timber	9
5.1 Mechanical resistance	9
5.1.1 General.....	9
5.1.2 Visual strength grading.....	9
5.1.3 Machine strength grading.....	9
5.2 Fire resistance (charring rate).....	11
5.3 Reaction to fire.....	11
5.4 Release of dangerous substances.....	12
5.5 Biological durability.....	12
5.5.1 Structural timber without preservative treatment.....	12
5.5.2 Structural timber with preservative treatment.....	13
5.6 Geometrical data	13
6 Assessment and verification of constancy of performance –AVCP	13
6.1 General.....	13
6.2 Type testing.....	13
6.2.1 General.....	13
6.2.2 Test samples, testing and compliance criteria	14
6.2.3 Test reports.....	15
6.2.4 Shared other party results.....	15
6.3 Factory production control (FPC)	15
6.3.1 General.....	15
6.3.2 Requirements	16
6.3.3 Product specific requirements.....	19
6.3.4 Initial inspection of factory and of FPC	20
6.3.5 Continuous surveillance of FPC.....	20
6.3.6 Procedure for modifications	21
7 Marking.....	21
7.1 Marking methods	21
7.2 Information on the timber (method A) or on the package (method B).....	21
7.3 Information in the documents accompanying strength graded structural timber.....	22
8 Environmental issues	23
Annex A (normative) Requirements for strength reducing characteristics for visual grading standards	24
A.1 Limitations for strength-reducing characteristics.....	24
A.1.1 Knots	24
A.1.2 Slope of grain	24

A.1.3	Density and rate of growth	24
A.1.4	Fissures	25
A.2	Limitations for geometrical characteristics	25
A.2.1	Wane	25
A.2.2	Warp	25
A.3	Limitations for biological characteristics	26
A.4	Other characteristics	26
A.4.1	Reaction wood	26
A.4.2	Other criteria	26
Annex B (normative) Marking codes for species		27
B.1	Marking codes for single species	27
B.2	Marking codes for species combination	28
Annex C (normative) Measurement of moisture content		30
C.1	General	30
C.2	Measurement of moisture content of timber during production	30
Annex ZA (informative) Clauses of this European Standard addressing the provisions of the EU Construction Products Regulation		31
ZA.1	Scope and relevant characteristics	31
ZA.2	Procedure for Assessment and Verification of the Constancy of Performance (AVCP) of strength graded structural timber with rectangular cross section	33
ZA.2.1	System(s) of AVCP	33
ZA.2.2	Declaration of performance (DoP)	34
ZA.2.2.1	General	34
ZA.2.2.2	Content	35
ZA.2.2.3	Example of DoP	35
ZA.3	CE marking and labelling	36
ZA.3.1	General	36
ZA.3.2	CE marking	36
ZA.3.3	Marking on the product or on a label attached to the package	39
Bibliography		41

European foreword

This document (EN 14081-1:2016) 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 August 2016, and conflicting national standards shall be withdrawn at the latest by November 2017.

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 14081-4:2009, EN 14081-1:2005+A1:2011.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Regulation n°305/2011.

For relationship with EU Regulation, see informative Annex ZA, which is an integral part of this document.

EN 14081-4:2009 will be withdrawn and replaced by 5.1.3, paragraph 2 of this document.

Compared to EN 14081-1:2005+A1:2011, the following modifications have been made:

- new Clause 6 for Assessment and Verification of Constancy of Performance linked to the CPR;
- Annex ZA has been adapted to the CPR;
- new clauses on Fire Resistance, release of dangerous substances, geometrical data and environmental issues have been added;
- marking codes for species combinations have been moved to Annex B;
- improvement of several definitions.

Other parts of the series of EN 14081 are:

- EN 14081-2, Timber structures - Strength graded structural timber with rectangular cross section - Part 2: Machine grading; additional requirements for initial type testing;
- EN 14081-3, Timber structures - Strength graded structural timber with rectangular cross section - Part 3: Machine grading; additional requirements for factory production control.

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.

Introduction

There are basically two methods of strength grading: visual grading and machine grading.

Machine grading is in common use in a number of countries. The countries use two basic systems, referred to as 'output control' and 'machine control'. Both systems require a visual override inspection to cater for strength-reducing characteristics that are not automatically sensed by the machine.

Output control is suitable for use where the grading machines are situated in manufacturing units grading limited sizes, species and grades in repeated production runs. This enables the system to be controlled by testing timber specimens from the daily output. These tests, together with statistical procedures, are used to monitor and adjust the machine settings to maintain the required strength properties for each strength class. With this system it is permissible for machine approval requirements to be less demanding and for machines of the same type to have non-identical performance.

Machine control was developed in Europe. Because of the large number of sizes, species and grades used it was not possible to carry out quality control tests on timber specimens drawn from production. Machine control relies, therefore, on the machines being strictly assessed and controlled, and on considerable research effort to derive the machines settings, which remain constant for all machines of the same type.

Visual grading is also in common use in a number of countries. There are many different visual strength grading standards for timber in use in Europe. These have come into existence to allow for:

- different species or groups of species;
- geographic origin;
- different dimensional requirements;
- varying requirements for different uses;
- quality of material available;
- historic influences or traditions.

Because of the diversity of existing visual grading standards in use in different countries, it is currently impossible to lay down a single standard for all Member States.

The requirements given in this European Standard on visual strength grading are therefore basic principles, which should be followed when drawing up requirements for limits for some of the characteristics.

The assignments to strength classes are based on grading reports.

When these grading reports are evaluated and approved by CEN/TC 124/WG2/TG1, they become Approved Grading Reports (AGR) which are required for assigning visual grades to EN 1912 and for machine control.

1 Scope

This European Standard specifies requirements for strength graded structural timber with rectangular cross-sections either visual or machine graded, shaped by sawing, planning or other methods and with cross-sectional dimensions complying with EN 336 (referred to as structural timber in the following clauses).

This European Standard includes provisions for test methods, Assessment and Verification of Constancy of Performance and marking of structural timber.

NOTE 1 For machine strength graded timber additional provisions for type testing (TT) are given in EN 14081-2 and for factory production control (FPC) in EN 14081-3.

NOTE 2 An acceptance procedure for verification of a lot is given in EN 14358 which may be used for a delivery of structural timber.

This European Standard identifies characteristics for which limits have to be given in visual grading standards.

This European Standard covers structural timber, untreated or treated against biological attack.

This European Standard does not cover:

- timber treated by fire retardant products to improve its fire performance;
- thermally and/or chemically modified timber;
- structural finger jointed timber.

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 338, *Structural timber — Strength classes*

EN 350-1, *Durability of wood and wood-based products — Natural durability of solid wood — Part 1: Guide to the principles of testing and classification of the natural durability of wood*

EN 350-2, *Durability of wood and wood-based products — Natural durability of solid wood — Part 2: Guide to natural durability and treatability of selected wood species of importance in Europe*

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

EN 844-7, *Round and sawn timber — Terminology — Part 7: Terms relating to anatomical structure of timber*

EN 844-9, *Round and sawn timber — Terminology — Part 9: Terms relating to features of sawn timber*

EN 844-10, *Round and sawn timber — Terminology — Part 10: Terms relating to stain and fungal attack*

EN 1310:1997, *Round and sawn timber — Method of measurement of features*

EN 1912, *Structural Timber — Strength classes — Assignment of visual grades and species*

EN 1995-1-2, *Eurocode 5: Design of timber structures — Part 1-2: General — Structural fire design*

EN 13183-2, *Moisture content of a piece of sawn timber — Part 2: Estimation by electrical resistance method*

EN 13183-3, *Moisture content of a piece of sawn timber — Part 3: Estimation by capacitance method*

EN 13238, *Reaction to fire tests for building products — Conditioning procedures and general rules for selection of substrates*

EN 13501-1, *Fire classification of construction products and building elements — Part 1: Classification using test data from reaction to fire tests*

EN 13501-2, *Fire classification of construction products and building elements — Part 2: Classification using data from fire resistance tests, excluding ventilation services*

EN 13556, *Round and sawn timber — Nomenclature of timbers used in Europe*

EN 13823, *Reaction to fire tests for building products — Building products excluding floorings exposed to the thermal attack by a single burning item*

EN 14081-2, *Timber structures — Strength graded structural timber with rectangular cross section — Part 2: Machine grading; additional requirements for initial type testing*

EN 14081-3, *Timber structures — Strength graded structural timber with rectangular cross section — Part 3: Machine grading; additional requirements for factory production control*

EN 15804, *Sustainability of construction works — Environmental product declarations — Core rules for the product category of construction products*

EN 15228:2009, *Structural timber — Structural timber preservative treated against biological attack*

EN 16485, *Round and sawn timber — Environmental Product Declarations — Product category rules for wood and wood-based products for use in construction*

EN ISO 3166-1, *Codes for the representation of names of countries and their subdivisions — Part 1: Country codes (ISO 3166-1)*

3 Terms and definitions

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

3.1

dry-graded structural timber

timber for which grading has been completed after it has been dried

3.2

grading standard

a set of grading rules contained in a National Standard or a proprietary document that is publically available

3.3

machine strength grading

process by which structural timber is sorted by a machine sensing, non-destructively, one or more properties of the timber, with any necessary visual overriding inspection, into grades or strength classes to which characteristic values of strength, stiffness and density may be allocated