

# SLOVENSKI STANDARD

## SIST EN 14081-3:2006

01-maj-2006

Nadomešča:

SIST EN 518:1996

SIST EN 519:1996

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**Lesene konstrukcije - Razvrščanje konstrukcijskega lesa pravokotnega prečnega prereza po trdnosti - 3. del: Strojno razvrščanje; dodatne zahteve za notranjo kontrolo proizvodnje**

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

Holzbauwerke - Nach Festigkeit sortiertes Bauholz für tragende Zwecke mit rechteckigem Querschnitt - Teil 3: Maschinelle Sortierung; zusätzliche Anforderungen an die werkseigene Produktionskontrolle

Structures en bois - Bois de structure de section rectangulaire classé selon la résistance - Partie 3 : Classement mécanique - Exigences complémentaires relatives au contrôle de la production en usine

**Ta slovenski standard je istoveten z: EN 14081-3:2005**

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**ICS:**

79.040	Les, hlodovina in žagan les	Wood, sawlogs and sawn timber
91.080.20	Lesene konstrukcije	Timber structures

**SIST EN 14081-3:2006**

**en**

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EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

**EN 14081-3**

November 2005

ICS 79.040

Supersedes EN 518:1995, EN 519:1995

English Version

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

Structures en bois - Bois de structure à section  
rectangulaire classé pour sa résistance - Partie 3:  
Classement mécanique; exigences supplémentaires en  
concernant le contrôle de la production en usine

Holzbauwerke - Nach Festigkeit sortiertes Bauholz für  
tragende Zwecke mit rechteckigem Querschnitt - Teil 3:  
Maschinelle Sortierung; zusätzliche Anforderungen die  
werkseigene Produktionskontrolle

This European Standard was approved by CEN on 26 August 2005.

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 Central Secretariat 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 Central Secretariat has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.



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

**Management Centre: rue de Stassart, 36 B-1050 Brussels**

## Contents

Page

Foreword .....	3
Introduction.....	4
1 Scope .....	5
2 Normative references .....	5
3 Terms and definitions .....	5
4 Symbols .....	6
5 Requirements for the operation, calibration and maintenance of a grading machine .....	6
6 Additional factory production control requirements for machine controlled systems .....	7
6.1 General .....	7
6.2 Requirements for strength grades with a characteristic bending strength above 30 N/mm <sup>2</sup> .....	7
7 Additional factory production control requirements for output controlled systems.....	7
7.1 General .....	7
7.2 Production control.....	7
Annex A (normative) Example of cusum control charts.....	11
Annex B (normative) Requirements for using control planks.....	15
B.1 General .....	15
B.2 Production control.....	15
B.3 The procedure for the use of a control plank .....	16
B.4 The non-continuous indicating property .....	16
B.5 Recorded usage of a control plank.....	17
B.6 Care of a control plank when not in use .....	17
B.7 Discarded control planks .....	17

## Foreword

This European Standard (EN 14081-3:2005) has been prepared by Technical Committee CEN/TC 124 "Timber structures", the secretariat of which is held by SFS.

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 May 2006, and conflicting national standards shall be withdrawn at the latest by August 2007.

This European Standard 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 Directive(s).

This European Standard supersedes EN 518:1995 and EN 519:1995.

Other parts of this European Standard are:

EN 14081-1 Timber structures - Strength graded structural timber with rectangular cross section – Part 1: General requirements,

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

EN 14081-4 Timber structures – Strength graded structural timber with rectangular cross section – Part 4: Machine grading; grading machine settings for machine controlled systems.

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

## Introduction

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

The output-controlled system is suitable for use where the grading machines are situated in sawmills grading limited sizes, species and grades in repeated production runs of around one working shift or more. 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.

The machine controlled system 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. The system 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.

The acceptability of grading machines and the derivation of settings rely on statistical procedures and the results will therefore depend on the method used. For this reason this European Standard gives appropriate statistical procedures.

The requirements in this European Standard are based on machines in current use and on future types of machines as far as these can be foreseen. It is recognised that additional clauses or standards may be required if unforeseen developments take place.

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## 1 Scope

This European Standard specifies requirements additional to those given in EN 14081-1 for factory production control of machine graded structural timber with rectangular cross-sections shaped by sawing, planing or other methods, and having deviations from the target sizes corresponding to EN 336.

## 2 Normative references

The following referenced documents are indispensable for the application of this European Standard. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 336, *Structural timber — Sizes, permissible deviations*

EN 338, *Structural timber — Strength classes*

EN 408, *Timber structures — Structural timber and glued laminated timber — Determination of some physical and mechanical properties*

EN 14081-1:2005, *Timber structures — Strength graded structural timber with rectangular cross section — Part 1: General requirements*

EN 14081-2:2005, *Timber structures — Strength graded structural timber with rectangular cross section — Part 2: Machine grading; additional requirements for initial type testing*

## 3 Terms and definitions

For the purpose of this European Standard, the terms and definitions given in EN 14081-1:2005 and the following apply.

### 3.1

#### **depth**

dimension perpendicular to the longitudinal axis of a timber beam, in the plane of the bending forces

### 3.2

#### **grade determining property**

mechanical or physical property for which a particular value of that property has to be achieved for the material to be assigned to that grade, e.g. bending strength, mean modulus of elasticity and density for the strength classes of EN 338

### 3.3

#### **master machine**

particular grading machine used for deriving the production settings during initial type testing

### 3.4

#### **sample**

number of specimens of timber of one size and representative of one species population

**EN 14081-3:2005 (E)****4 Symbols**

$A$	cusum control parameter
$B$	cusum control parameter
$B_a$	cusum parameter associated with acceptable quality level
$B_r$	cusum parameter associated with rejectable quality level
$E_p$	actual modulus of elasticity measured in a proof load test (in N/mm <sup>2</sup> )
$E_{0,mean}$	characteristic mean modulus of elasticity parallel to grain (in N/mm <sup>2</sup> )
$F_p$	proof load (in N)
$K$	cusum control parameter
$L_a$	run length in acceptable region for cusum control
$L_r$	run length in rejectable region for cusum control
$N$	cusum control parameter
$Y$	cusum control parameter
$Z$	cusum control parameter

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**5 Requirements for the operation, calibration and maintenance of a grading machine**

**5.1** No modifications shall be made to the machine that are in conflict with the machine manufacturer's specification.

**5.2** Access to all machine adjustments shall be limited to personnel authorised to operate or set up the machine.

**5.3** The strength grading machine shall be regularly calibrated in accordance with the manufacturer's specification (see 5.2 in EN 14081-2:2005).

**5.4** A strength grading machine shall only be fitted with spare parts equivalent to, or improving upon, the performance of those fitted at the time the machine was assessed by initial type testing. If spare parts are fitted that are not identical to those fitted at the time the machine was assessed by initial type testing, they shall be reassessed to establish their effect on grading accuracy.

**5.5** The results of routine service and maintenance to the strength-grading machine and ancillary equipment shall be recorded together with the results of calibration checks.



## 6 Additional factory production control requirements for machine controlled systems

### 6.1 General

When grading structural timber in a machine controlled system, grading accuracy shall be monitored. A grading machine's dynamic performance may be controlled by the use of control planks. Where control planks are used the additional procedures given in Annex B shall be followed

### 6.2 Requirements for strength grades with a characteristic bending strength above 30 N/mm<sup>2</sup>

During each working shift, two pieces of timber from each grade produced shall be randomly selected and tested for edgewise bending strength as given in EN 408 with the tension edge selected at random and the estimated weakest cross section positioned where possible within the centre third of the span. The fifth percentile value, determined by ranking, of the 100 bending strength values from 50 consecutive shifts shall meet the required bending strength (as given in 6.2.4.3 b) in EN 14081-2:2005).

A strength property other than edgewise bending strength may be used for quality control as an alternative, provided the relation between the two properties is verified from test data.

## 7 Additional factory production control requirements for output controlled systems

### 7.1 General

When grading structural timber in an output controlled system, grading accuracy shall be monitored by testing samples drawn from production and analysing the results using the cusum procedure described as follows.

### 7.2 Production control

**7.2.1** Five specimens of the strength class to be tested shall be counted, then the sixth specimen shall be selected for the test sample. This procedure shall be repeated ten times to select two five-specimen samples from each class produced during each working shift. This process shall take place at approximately equal intervals during the shift period. For the first three working shifts the sampling rate shall be doubled using newly assessed settings.

**7.2.2** Each sample selected from production shall be tested as follows, using the apparatus described in 7.2.1 a) of EN 14081-2:2005.

- a) Proof load to  $F_p$  (as specified in 7.2.2 of EN 14081-2:2005) each specimen edgewise over a span of 18 times the piece depth and using third-point loading with the tension edge selected at random and the estimated weakest cross section positioned where possible within the centre third of the span.
- b) Determine the actual modulus of elasticity  $E_p$  in accordance with 7.2.1 c) of EN 14081-2:2005.

The rate of applied stress shall be 110 N/mm<sup>2</sup>/min. The number of specimens that fail below the proof load and the values of  $E_p$  shall be recorded on the cusum control charts.

NOTE For an example see Annex A.