



**SLOVENSKI STANDARD**  
**SIST EN 518:1996**  
**01-avgust-1996**

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**Konstruktivski les - Razvrščanje - Zahteve za standarde za vizualno razvrščanje po trdnosti**

Structural timber - Grading - Requirements for visual strength grading standards

Bauholz für tragende Zwecke - Sortierung - Anforderungen an Normen über visuelle Sortierung nach der Festigkeit

Bois de structure - Classement - Exigences pour les normes de classement visuel de résistance

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**ICS:**

79.040	Les, hlodovina in žagan les	Wood, sawlogs and sawn timber
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EUROPEAN STANDARD

EN 518

NORME EUROPÉENNE

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Descriptors: Wood, timber constructions, filing, visual examination, mechanical strength, quality classes, appearance, specifications, marking

English version

## Structural timber - Grading - Requirements for visual strength grading standards

Bois de structure - Classement - Exigences pour  
les normes de classement visuel de résistance

Bauholz für tragende Zwecke - Sortierung -  
Anforderungen an Normen über visuelle  
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This European Standard was approved by CEN on 1995-02-22. 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.

The European Standards exist 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, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

# CEN

European Committee for Standardization  
Comité Européen de Normalisation  
Europäisches Komitee für Normung

Central Secretariat: rue de Stassart, 36 B-1050 Brussels

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## Foreword

This European Standard has been prepared by the Technical Committee CEN/TC 124 "Timber structures" of which the secretariat is held by DS.

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 1995, and conflicting national standards shall be withdrawn at the latest by August 1995.

In accordance with the CEN/CENELEC Internal Regulations, the following countries are bound to implement this European Standard: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

## Introduction

There are many different visual strength grading rules 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; [SIST EN 518:1996](https://standards.iteh.ai/catalog/standards/sist/2ebc21f2-c19d-4d91-8722-6185b1545a23/sist-en-518-1996)
- varying requirements for different uses;
- the quality of material available;
- historic influences or traditions.

Because of the diversity of existing grading rules in use in different countries it is currently impossible to lay down a single set of acceptable rules for all member states.

This standard on visual strength grading rules therefore gives basic principles which shall be followed when drawing up requirements for limits for some of the characteristics.

In laying down visual strength grading rules two main factors shall be borne in mind:

- they shall clearly separate timber into grades;
- the rules and the text shall be easily understood and be capable of implementation by graders in the sawmills.

Examples of grading standards currently in use and which meet these principles are listed in annex A.

## 1 Scope

This standard identifies the characteristics for which, as a minimum, limits shall be given in visual grading rules.

This standard applies to both softwood rules and hardwood rules and covers visual strength grading of sawn timber of all species likely to be used for load bearing structural purposes. For machine grading, see EN 519.

## 2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard, only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

EN 338	Structural timber - Strength classes
EN 384	Structural timber - Determination of characteristic values of mechanical properties and density
EN 519	Structural timber - Grading - Requirements for machine strength graded timber and grading machines

## 3 Definitions

For the purposes of this standard the following definitions apply:

**3.1 visual strength grading:** Process by which a piece of timber can be sorted into categories in order to allocate reliable strength and stiffness values to it, and that can be carried out entirely by visual inspection of surface or cross-sectional characteristics or defects, or equipment which does not directly stress the piece, or by combination of both of these methods.

**3.2 reaction wood:** High density wood which is formed in the standing tree. In softwood species it is known as compression wood and in hardwood species as tension wood. It is contained in only part of the cross-section of a tree and so may form either the whole or only part of the cross-section of a piece of sawn timber, leading to problems of distortion after drying.

#### 4 Requirements for standards on visual strength grading

Strength grading standards shall include limits for the characteristics and their methods of measurement given in clauses 5 to 8.

If the grading is restricted to a special use e.g. flatwise bending or compression, this shall be clearly stated.

NOTE: Special purpose grades cannot be assigned to the strength classes given in EN 338.

If there are any restrictions or additional criteria with regard to the application of the rules they shall be stated in the standard. Such additional criteria shall relate to the strength or constructional use of timber.

Where the measurement or estimation of a particular parameter needs particular skills, equipment or training, they shall be stated in the standard.

Unless otherwise stated 20 % moisture content shall be taken as the reference point for all measurements.

Limits of reduction in size shall be stated beyond which reprocessing invalidates the grading.

If, when grading, automatic devices are used to estimate the size or shape of the visual characteristics or to estimate the size or geometrical shape of the individual pieces, such automatic devices shall only be used to assess the grade of each piece against the visual grading requirements of the standard.

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#### 5 Limitations for strength reducing characteristics

##### 5.1 Knots

Maximum dimensions of knots or knot holes shall be specified in one of the following ways:

- a) in relation to the width and or thickness of timber on the basis of linear values,
- b) in relation to the cross-sectional area of timber on the basis of cross-sectional values,
- c) in relation to absolute values for a given range of timber sizes.

NOTE: Different limitations on knot sizes can be specified for different portions of the piece e.g. a margin area with different knot limitations from the rest of the piece may be included.

In certain species and sizes knot groupings affect the timber strength and should be taken into account.

## 5.2 Slope of grain

The grading standard shall have a definition of slope of grain, a method for its measurement and limitations on the slope of grain for each grade specified.

NOTE 1: For the limitations on the slope of grain values in the following increments are preferred: 1:4, 1:6, 1:8 and 1:10.

NOTE 2: Local fibre deviations around knots or other defects should be disregarded in measuring slope of grain.

## 5.3 Density and rate of growth

The grading standard shall contain a requirement for either density or rate of growth.

If density is specified it shall be linked to a stated moisture content.

NOTE 1: The preferred moisture content for this purpose is 20 %.

Where the density is given at a moisture content other than 20 % correction factors shall be available for correction to 20 %.

NOTE 2: EN 384 gives a method of density correction.

If rate of growth is specified the standard shall include limits for rate of growth and its method of measurement.

NOTE 3: For limits for rate of growth the values in the following increments of ring width are preferred: 15 mm, 10 mm, 8 mm, 6 mm, 4 mm and 3 mm.

## 5.4 Fissures

If experience and research show that fissures have no significant effect on strength they can be disregarded. Otherwise they shall be limited.

Fissures less than 1 mm wide may be disregarded. The maximum length of fissures should be as given in table 1.



Table 1: Maximum length of fissures

Type	Max. permissible length corresponding to strength classes C18 <sup>*)</sup> and below	Max. permissible length corresponding to strength classes above C18 <sup>*)</sup>
Fissures going through timber	Not greater than 600 mm in any 1 m length	Twice width of piece
Fissures not going through timber	Unlimited	Half length of piece

NOTE: The length of fissures is linked with moisture content and therefore, the limits given in table 1 can only be applicable at the time of grading.

<sup>\*)</sup> According to EN 338

## 6 Limitations for geometrical characteristics

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### 6.1 Wane

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Criteria for the wane limitations with references to the width, thickness and length of the piece and its method of measurement shall be given.

The maximum wane permitted should not reduce the edge and face dimensions to less than 2/3 of the basic dimensions of the piece.

NOTE: Wane does not reduce the strength, but should be restricted for general building reasons. (Wane may be undesirable when nail plates or connectors are used or there is transverse compression).

### 6.2 Distortion

The limitations of maximum permitted values of distortion for bow, spring and twist shall be given. Maximum distortion should be as given in table 2.

NOTE 1: Even if distortion of timber does not directly influence strength, it is necessary that timber for building purposes should be subject to some restrictions in this respect.

NOTE 2: Distortion is linked with moisture content and can therefore change with time.

NOTE 3: Distortion is often linked to the dimensions of timber.