

# INTERNATIONAL STANDARD

# ISO 16415

First edition  
2012-08-01

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## Non-structural timber grading requirements

*Exigences pour le classement des bois non structurels*



Reference number  
ISO 16415:2012(E)

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Published in Switzerland

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## Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 16415 was prepared by Technical Committee ISO/TC 218, *Timber*.

## Introduction

This International Standard describes the essential requirements of non-structural timber grading rules. These requirements have been kept to the essential minimum to ensure maximum scope and flexibility in the application of this International Standard. The notes listed throughout this International Standard are intended to clarify the meaning of a requirement and/or to assist in the implementation of the requirement.

The general idea is for any non-structural timber grading rule to be acceptable, provided it is accurately defined and contains the minimum requirements set forth in this International Standard. It is expected that each region, country or industry sector will write its own non-structural timber grading rules that will comply with the normative requirements stated herein, but which will have features that are specific to its own production, technology infrastructure and market conditions.

Non-structural timber can be produced from non-coniferous and coniferous species of trees that grow throughout the northern and southern hemispheres. Non-coniferous species are botanically Angiosperms, where the seeds are enclosed in the flower of the ovary; the wood of non-coniferous species contains vessels, and is therefore porous. Coniferous species are botanically Gymnosperms, where the seeds are not enclosed in the ovary of the flower; the wood of coniferous species contains no vessels, and is therefore nonporous. Possessing unique natural characteristics that affect machining, durability and usability, sawn non-structural timber produced from non-coniferous and coniferous species has an extensive history of satisfactory use by consumers everywhere.

Globally, non-structural timber has numerous classifications, uses, and standards. Recognizing the complexities of an assortment of grading rules that are applicable to non-coniferous and coniferous species, this International Standard is not specifically based on any one grading rule or grading standard. This International Standard delineates and illustrates broad grade categories that specify essential features typically found in the broad categories based on commonalities of numerous grading rules used for sawn non-structural timber of non-coniferous and coniferous species in international commerce.

Sawn non-structural timber produced from non-coniferous and coniferous species contains natural characteristics that are inherently different in quality, thus the resultant products have a variety of end uses. Because of this, the grading systems used to classify the sawn non-structural timber are numerous but can generally be separated into two basic systems that use a visual assessment of the timber.

One visual grading system uses a classification scheme based on the usable content of the piece of sawn non-structural timber aside from any parts which can be considered undesirable for use. This type of grading system determines usable content of the piece by using “cuttings” or similar units between undesirable defects to determine the usable content of the piece. Sawn non-structural timber products produced under this type of grading system are generally intended to be further manufactured to obtain products that can be used in interior or exterior applications, often with exposed surfaces and having clear or light finishes.

The second visual grading system uses a classification scheme based on the usability of the full length of the piece. Sawn non-structural timber products produced under this type of grading system are used in many building applications and are generally not intended to be further manufactured.

Sawn non-structural timber produced from non-coniferous and coniferous species can be graded using either grading system. Generally, sawn non-structural timber produced from non-coniferous species is graded using a classification scheme based on the usable content of the piece, whereas, sawn non-structural timber produced from coniferous species is graded using a classification scheme based on the usability of the full length of the piece.

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# Non-structural timber grading requirements

## 1 Scope

This International Standard delineates and illustrates broad grade categories that specify essential features typically found in those categories based on commonalities of numerous national standards and grading rules used for non-structural timber of non-coniferous and coniferous species in international commerce. It provides a basis for recognition of a national standard or grading rules that comply with this International Standard and is applicable to all methods of visual grading systems for non-structural timber of all non-coniferous and coniferous species of timber.

Non-structural timber produced from bamboo is not covered in this International Standard.

## 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 revisions) applies.

ISO 24294, *Timber — Round and sawn timber — Vocabulary*

## 3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 24294 and the following apply.

### 3.1

#### **characteristics**

distinguishing features which by their extent, location, and number determine the quality of a piece of non-structural timber

NOTE The limiting characteristics of any grade of timber are described in the grading rules.

### 3.2

#### **grade**

population of non-structural timber, derived from a specified resource by applying a specified sorting procedure

### 3.3

#### **grading rules**

requirements and specifications for the manufacture, inspection and grading of designated species of non-structural timber

### 3.4

#### **nominal size**

size by which non-structural timber is known or specified at a stated moisture content

NOTE In the United States and Canada nominal size does not reflect the planed size of non-structural timber.

### 3.5

#### **planed timber**

non-structural timber that, at the end-use moisture content, has been machined for its full length and width on at least one face to obtain a smooth surface

### 3.6

#### **prepared timber**

non-structural timber that, at the end-use moisture content, has been cut to length, machined on one or more surfaces, or both, within agreed permitted deviations

**3.7**  
**profiled timber**  
non-structural timber that, after drying, has been machined to obtain a specified, but not rectangular, cross-section

**3.8**  
**rough sawn timber**  
sawn non-structural timber that has not undergone any further machining, which is to specified permitted deviations

## 4 Non-structural timber classification

### 4.1 General

Sawn non-structural timber shall be classified according to the use, extent-of-manufacture and standard minimum sizes.

### 4.2 Use

#### 4.2.1 Yard timber

Sawn non-structural timber is timber of those grades, sizes, and patterns intended for non-structural applications.

#### 4.2.2 Factory and shop timber

Sawn non-structural timber is timber produced or selected for remanufacturing purposes and intended for non-structural applications.

### 4.3 Extent-of-manufacture

Sawn non-structural timber may be classified according to the surface manufacture of the timber; examples are rough sawn timber, planed timber, prepared timber and profiled timber.

### 4.4 Standard non-structural timber sizes

The minimum standard sizes of both rough sawn and planed timber shall be provided for in the grading rules.

## 5 Grading rule requirements

### 5.1 General concepts

#### 5.1.1 General

The grading process shall involve sorting sawn non-structural timber according to defect limitations as specified in the grading rules. Conceptually there are an infinite number of sorting procedures that may be used. Any method may be used provided it is correctly defined.

NOTE 1 Rules for grade sorting typically comprise rules for ensuring adequate utility features.

NOTE 2 National standards or grading rules containing grade sorting processes generally comply with the intent of this International Standard.

#### 5.1.2 Grading parameters

The basic provisions for the grading of sawn non-structural timber shall be uniform, as far as permitted by the different characteristics of species, the quality of logos, the conditions of manufacture, and the intended use of the product. Grading rules shall establish a maximum percent below grade as an allowable variation between



qualified graders. The grading of sawn non-structural timber cannot be considered an exact science because it is based on either a visual inspection of each piece or the judgment of the grader.

NOTE The established maximum percent below grade is normally contained in national standards or grading rules; percentages of 5% to 10% allowable variations are common.

### 5.1.3 Minimum grade requirements

The method of determining the extent and limitations of the characteristics permitted in the poorest pieces admissible in each grade of timber shall be stated in a grading rule, except in the lowest grade of each classification. Since sawn non-structural timber grades are broad manufacturing categories, grades overlap and pieces are selected from a grade to comprise another grade outside of that grade category. A specific shipment shall not be made up of only pieces containing characteristics of the maximum number or size permitted in the grade.

### 5.1.4 Grade characteristics

Characteristics permitted and limitations for rough sawn non-structural timber shall be the same as those prescribed in grading rules for planed timber of the same grade; in addition, characteristics that will disappear in standard planing shall be allowed. If characteristics other than those described in the grading rules are encountered, the characteristic shall be evaluated in relation to the characteristics permitted or limitations prescribed for the grade under consideration and shall be allowed if regarded as equivalent or less damaging in effect on the appearance or other utility value of the piece. In all grades, the size of allowable characteristics shall not exceed that specified in the respective grading rules.

NOTE In many grades, the size of permitted characteristics varies in proportion to the size of a face or the area of a cross-section of the piece. In timber graded using the "cutting" system, the respective grades commonly list maximum sizes permitted for splits, knots, holes, bark, etc., where necessary.

### 5.1.5 Special provisions

When heartwood, sapwood, grain classifications, and other optional provisions are specified, and the sawn non-structural timber conforms to the requirements of such special provisions as well as to the regular grade designated, it shall be regarded as of standard quality.

### 5.1.6 Nonstandard grades

When nonstandard grades, sizes, or patterns are specified, or when particular provisions of a standard grade are waived or changed, grading shall be made accordingly, but all of the other provisions of the grading rules shall apply.

## 6 Use classification provisions for visual grading of non-structural timber

### 6.1 Yard non-structural timber

#### 6.1.1 Grade classifications

The grading of planed yard non-structural timber is based upon the uses for which the particular grade is designed and is applied to each kind with reference to its size and length when graded without consideration to further manufacture. On the basis of quality, basic grade classifications of yard timber shall be as follows.

##### 6.1.1.1 Coniferous species

###### 6.1.1.1.1 Select

Timber that is generally used for natural and paint finishes.

NOTE Coniferous can be clear face too.

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### 6.1.1.1.2 Common

Timber that is generally used for utility purposes.

### 6.1.1.2 Non-coniferous species

#### 6.1.1.2.1 Clear-face cutting grades

Timber that is generally used for natural or paint finishes.

#### 6.1.1.2.2 Sound cutting grades

Timber that is generally used for natural or paint finishes.

#### 6.1.1.2.3 General and utility grades

Timber that is generally used as an unfinished exterior product.

### 6.1.2 Yard timber sizes

The planed thicknesses and widths of yard timber shall be as specified in the grading rule and shall be considered as minimum standards for the corresponding nominal sizes as shown.

NOTE When timber of standard size, rough or planed is described by its nominal dimension, the planed sizes are generally shown on invoices and other documents.

## 6.2 Factory and shop timber

### 6.2.1 Grade classification

#### 6.2.1.1 Coniferous species

The grade classifications of factory and shop timber shall be as shown in the grading rule.

#### 6.2.1.2 Non-coniferous species

The grade classifications of the various "cutting" grades shall be as shown in the grading rule.

### 6.2.2 Grade characteristics

Factory and shop timber shall be graded with reference to its use for doors and sashes, or on the basis of characteristics affecting its use for general cutup purposes, or on the basis of size of cuttings. Its grade shall be determined by the percentage of the area of each board or plank available in cuttings of specified or of given minimum size and qualities, and shall be determined from the poor face based on the quality of both sides of each cuttings, unless otherwise specified in the grading rule.

### 6.2.3 Grade sizes

The sizes for factory and shop timber shall be as shown in the grading rule.

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## 7 Control of grade sorting process

### 7.1 Grader requirements

The grader shall be able to grade timber accurately at the necessary operational speeds and should cover all grades and sizes that the grader will undertake in commercial practice.

NOTE 1 Training can provide the skills necessary for grading.

NOTE 2 Grading by a machine is acceptable provided the machine is capable of separating the lumber into grade(s) that conform to the applicable grading rule.

### 7.2 Rules to satisfy utility requirements

A grading operation shall comply with any utility criteria specified in a grading rule. These criteria typically relate to appearance features, size tolerance, squareness of rectangular sections, crookedness and moisture content. The utility requirements are generally related to the marketing of timber.

### 7.3 Internal quality control

A periodic check shall be made to assess the accuracy of the grading process. If the checks indicate that the process is inadequate, then appropriate measures shall be undertaken to modify the process.

NOTE The above check is usually performed by regrading a sample of graded timber. An example of a pass criterion is a check that indicates a grade accuracy level as defined in 5.1.2.

## 8 Inspection

### 8.1 Certification and supervision

When sawn non-structural timber is graded, the grading shall be under the direction of a party that is competent and has adequate facilities for such supervision.

### 8.2 Delegation of grading authority

Permission to grade shall be delegated only to those producers (mills) which have demonstrated and proven their ability to conform to and are currently in conformance with the grading rules for the species and grades which they manufacture.

The producer (mill) shall also agree to maintain the established standards of size and grade and to submit its timber to inspection by the supervisory party, both at the producing facility (mill) and at destination, if a complaint is received.

### 8.3 Service

Inspection service shall be required for the inspection of grades not described in the rules only when written detailed specifications accompany the request for such inspection. For the inspection of standard grades in nonstandard sizes, inspection service shall be required according to 5.1.6 unless otherwise prescribed in the contract of purchase and sale.

## 9 Control in case of dispute

### 9.1 General

Subject to freedom of agreement between buyer and seller as to the settlement of complaints, the purchase, sale, or shipment of sawn non-structural timber grades shall be construed as involving agreement to submit timber to reinspection by a competent party under the published rules by which the timber was graded. In

recognition of the numerous industry practices that exist for the settlement of complaints of sawn non-structural timber grades, grading rules complying with this International Standard shall include specific provisions for reinspection in case of complaint, and reinspection shall be available to anyone at reasonable cost.

## 9.2 Complaints

Grade complaints on sawn non-structural timber shall be recognized only when the timber is in the form in which it was shipped. Any subsequent change in manufacture, working or through kiln-drying shall relieve the seller of responsibility for any grade complaints.

### 9.2.1 Buyer's responsibilities

The grading rules shall state the buyer's responsibilities regarding compliance to grade, size, and/or specified moisture content. The grading rules shall clearly state that portion of the disputed timber shipment to be held intact and properly protected for a specified amount of time after the date of the request for inspection or reinspection. The grading rules shall require that the buyer file a complaint on the disputed timber shipment with the seller within a specified time frame.

### 9.2.2 Seller's responsibilities

Upon receipt of a complaint from the buyer, the seller shall immediately request the organization under whose rules shipment has been made, or such other organization that was agreed upon, to provide inspection, reinspection or retally as required according to the provisions of the grading rules in effect at the time of execution of the contract.

### 9.2.3 Cost and assistance

The expense of such inspection, reinspection, or retally shall be borne in accordance with the inspection provisions of the applicable grading rules. The buyer shall lend all reasonable assistance to facilitate the inspection, reinspection or retally.

### 9.2.4 Tally, grade, and size complaints

In case of a complaint involving tally, the entire item shall be held intact for retally. In case of a complaint regarding grade or size the buyer shall comply with the provisions of the grading rules.

### 9.2.5 Moisture content complaints

In case of a complaint involving moisture content, the buyer shall comply with the provisions of the grading rules and a reinspection involving a complaint on moisture content shall be made in accordance with the provisions of the applicable grading rules. The grading rules shall establish a standardized procedure to be used for resolving complaints on moisture content.

## 9.3 Reinspection results

If a reinspection of the disputed shipment complies with the provisions of the grading rules under which the timber was graded and sold, each item of the shipment shall be graded according to the invoiced grade.

## 10 Product identification

Sawn non-structural timber shall be identified to indicate the details of the product specification. Sawn non-structural timber may be marked or non-marked; however, if non-marked each shipment shall be accompanied with documentation containing the information as required for marking.

NOTE Marking usually includes species or species group, grade, the standards to which the product is produced and whether the timber is seasoned or unseasoned.

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