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Round timber — Requirements for the measurement of dimensions and methods for the determination of volume

Bois ronds — Exigences pour le mesurage des dimensions et méthodes pour déterminer le volume

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Foreword

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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 13059 was prepared by Technical Committee ISO/TC 218, *Timber*.

This first edition cancels and replaces ISO 4480:1983 which has been technically revised.

Introduction

The main purpose of this International Standard is to establish common requirements for the measurement of dimensions and methods for the determination of round timber volume. It has been developed based on EN 1309-2:2006.

This International Standard aims to:

— establish requirements for the measurement of dimensions and methods for the determination of round timber volume;

— harmonize the requirements of the various standardization systems (ISO, CEN, and national standardization organizations) for the measurement of dimensions and methods for the determination of round timber volume;

— provide technological unity and compatibility of scientific and technical information concerning round timber;

— reduce the technical barriers in the international trade of round timber, simplify the procedures of trading operations and intercalculations between timber producer, customer and seller.

Round timber — Requirements for the measurement of dimensions and methods for the determination of volume

1 Scope

This International Standard establishes requirements for the measurement of dimensions and methods for the determination of round timber volume.

2 Normative reference

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 amendments) applies.

ISO 4476:1983, *Coniferous and broadleaved sawlogs — Sizes — Vocabulary*

ISO/IEC Guide 99:2007, *International vocabulary of metrology — Basic and general concepts and associated terms (VIM)*

3 Terms and definitions

For the purposes of this document, the terms and definitions, given in ISO 4476:1983, ISO/IEC Guide 99:2007 and the following apply.

3.1
dimension
numerical value of the linear dimension (diameter, length, etc.) in the chosen units of measurement

3.2
diameter of round timber
distance between two parallel lines tangential to a lateral surface of the stem in a place of measurement and lying in a section perpendicular to a longitudinal axis of round timber

3.3
length of round timber
shortest distance between the ends of round timber

3.4
nominal length of round timber
specified length of round timber, disregarding any crosscut allowance

3.5
crosscut allowance
extension of nominal length for the benefit of loss compensation during cross-cutting

3.6
piece-by-piece determination of round timber volume
determination of round timber volume based on measurement of the diameter (over or under the bark) and the length of every unit of round timber

3.7
solid volume of round timber
quantity of wood in a round timber based on its dimensions (under the bark) and expressed in cubic metres

3.8
piled volume of round timber
space occupied by a pile of round timber and determined by its external dimensions, including air spaces

3.9
group determination of round timber volume
determination of round timber volume by geometric method, by mass or by hydrostatic weighing (xylometric) method

3.10
measurement method
generic description of a logical organization of operations used in a measurement

NOTE Measurement method may be qualified in various ways such as direct measurement method and indirect measurement method.

[ISO/IEC Guide 99:2007, definition 2.5]

3.11
measurement procedure
detailed description of a measurement according to one or more measurement principles and to a given measurement method, based on a measurement model and including any calculation to obtain a measurement result

[ISO/IEC Guide 99:2007, definition 2.6]

3.12
direct measurement
measurement when the target value of a physical quantity is obtained directly by measurement instruments

3.13
indirect measurement
determination of the target value of a physical quantity based on the results of direct measurements of the other physical quantities which are functionally connected with the target value

3.14
coefficient of timber compactness
coefficient of transformation of piled volume into the solid one

4 General requirements for the measurement of dimensions and methods of determination of round timber volume

4.1 Due to the measuring means, the dimensions of round timber are obtained by direct or indirect measurements.

NOTE An example of indirect measurements of dimensions is an application of electronic measuring means.

4.2 Determination of round timber volume utilizes indirect measurements, obtained from the results of direct measurements of round timber dimensions or linear parameters of round timber stack (bunch, bundle, etc.).

4.3 When measuring, metric units shall be used.

4.4 When measuring round timber dimensions, one should aspire to reduce the quantity of measuring operations in the chain of deliveries of round timber, to reduce errors in measurements and to increase the accuracy of measurements.

4.5 Determination of dimensions and volume of round timber shall be carried out with measuring instruments and certified measurement procedures.

4.6 The measurement procedures shall provide particular measurement accuracy taking into account specified measurement error.

4.7 The instruments applied for the measurement of round timber dimensions shall provide the following measurement accuracy: ± 1 mm for the diameter; ± 1 cm for the length.

4.8 When measuring round timber dimensions, the influence of timber drawbacks (knots, excrescence, mechanical injury) on the results of conducted measurements shall be excluded.

4.9 The round timber volume may be determined by the following:

— by piece, where the volume of every unit of round timber is determined by the results of the measurement of its diameters and length;

— by group, where the volume of a set of round timber is determined by the results of the measurement of dimensions of the bunch, the bundle or the transport pack.

4.10 As a principle of round timber measurements, the following methods of determining their volume may be used: pile, by mass, hydrostatic weighing (xylometric), photographic, electron-optical.

4.11 Use of different methods of the determination of round timber volume is regulated by national statutory acts and contracts for delivery of round timber.

4.12 Measurement of dimensions and volume of round timber can be carried out over or under the bark, thus the methods of measurement conversion shall be defined.

4.13 Applied methods of measurement of dimensions and methods of the determination of round timber volume shall provide for the smallest personal influence on the measurement results.

5 Additional requirements for the measurement of round timber dimensions

5.1 Round timber diameter shall be measured in centimetres on the length of a perpendicular between two parallel lines tangential to the lateral surface of round timber from the opposite sides. The perpendicular by which the diameter is measured shall generate a right-angle with the longitudinal axis of round timber. The results of the measurement of the round timber diameter shall be rounded off up to a whole number. Therefore, fractions of less than 0,5 cm shall be disregarded, and fractions of 0,5 cm and greater shall be rounded off up to the next whole number.

NOTE Round timber with a diameter of 14 cm and greater may be measured in a whole even number and rounded off up to the even number. Therefore, the fractions of less than the odd whole number are disregarded, and the whole odd number and fractions greater than odd number are rounded off up to the next whole number.

5.2 Depending on the applied method of determination of round timber volume, the measurements shall be carried out as follows:

— measurement of the top diameter of round timber: directly at the end or at a distance of no more than 15 cm from the corresponding cross-cut end;

— measurement of the butt diameter of round timber: directly at the end or at a distance of no more than 15 cm from the corresponding cross-cut end;

NOTE If there is a buttress, the butt diameter is measured at a distance of 50 cm from the corresponding cross-cut end.

— measurement of the mid-diameter of round timber: at a half of the round timber length.

5.3 To determine the average diameter of round timber from two diameter measurements, the diameter shall be calculated as the arithmetic mean value of two mutually perpendicular diameters.

5.4 If there are drawbacks or mechanical injury at the point of measurement of round timber diameter, two diameter measurements equally distanced at no more than 15 cm from this point shall be carried out.

5.5 If double measurement of the diameter is carried out, the result of each measurement shall be rounded off up to the whole number, then the arithmetical mean value of two measurements is calculated and rounded off according to the rules of arithmetical rounding to the whole number.

5.6 Round timber length shall be measured in metres as the shortest distance between the cross-cut ends of round timber and rounded off up to 0,01 m reducing the cross-cut allowance.

5.7 Round timber length shall be measured as the shortest distance between two parallel surfaces, crossing the full cross-section of round timber at each end perpendicularly to its longitudinal axis.

5.8 Round timber with a multiple sweep shall be divided into straight parts or parts with a simple sweep, and the length of each piece shall be measured separately.

5.9 The length of round timber with undercut or butt trimming shall be measured from the center of the undercut or butt trimming to the opposite cross-cut end of round timber.

6 Additional requirements for the methods for the determination of round timber volume

6.1 Volume shall be measured in cubic metres and determined by multiplication of the cross-section area of round timber by the corresponding nominal length.

6.2 When the piece-by-piece method of volume determination is used, the mutual bracing of round timber and their condition are to allow to identify the top and the butt end of round timber, and to provide the availability of application of measurement means for the determination of round timber dimensions.

6.3 The piece-by-piece method is used for the determination of solid volume of round timber in stacks on the cutting area, worksite and vehicle, and for the determination of the coefficient of timber compactness.

6.4 The volume of a round timber lot, measured by the piece-by-piece method, is determined by adding the volume of each round timber included in the lot.

6.5 The results of calculating the volume of an individual round timber are rounded off up to 0,001 m^3 and for a round timber lot, up to 0,01 m^3.

6.6 The volume of an individual round timber can be determined by the volume tables given in national standards.

6.7 When the pile method of determination of round timber volume is used, the linear dimensions of the stack (length, height, width) shall be measured and the solid volume of round timber shall be calculated by the coefficient of timber compactness.

6.8 The total volume of a round timber lot shall be determined by adding the volumes of the stacks included in a lot and shall be rounded off up to 0,001 m^3.

6.9 When the round timber volume is determined by the pile, the place, the order and quantity of direct measurements of dimensions shall be established.

6.10 When the solid volume of a round timber stack is determined, the procedure of its calculation, the method of the determination and application of coefficient of timber compactness shall be established.

6.11 If contradictions regarding determination of round timber volume by the group method occur, the piece-by-piece method shall be applied.

6.12 The volume of round timber composing a carload, ship or vehicle may be determined by mass.

6.13 The weight of a transported lot of round timber is determined as the difference between the gross weight and the weight of the package, measured in tons.