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Timber structures — Testing of joints made with mechanical fasteners — Requirements for wood density

Structures en bois — Essai des assemblages réalisés par organes mécaniques — Exigences concernant la masse volumique du bois

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Foreword

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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 8970 was prepared by Technical Committee ISO/TC 165, *Timber structures*.

This second edition cancels and replaces the first edition (ISO 8970:1989), which has been technically revised.

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Introduction

The need to prescribe restriction of density for timber connection tests dates back many decades. In using the standard density, the boundaries set are considered too restrictive. This leads to difficulties in sampling timber elements and increased laboratory testing costs. Moreover, evidence has surfaced that the effect of density on the load-bearing capacity of connections is in many cases less significant than expected, and that many other parameters influence it.

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Timber structures — Testing of joints made with mechanical fasteners — Requirements for wood density

1 Scope

This International Standard specifies a method, based on density, for the selection of pieces of wood used in determining the strength and stiffness properties of connections made with mechanical fasteners.

It is assumed the wood density is normally distributed and that any deviations are reported.

This International Standard is applicable only to specimens of wood.

NOTE It is emphasized that the wood density is only one of the properties that can influence the strength of a joint. Other relevant properties are, for example, growth-ring size, slope of grain, toughness and hardness.

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 amendments) applies.

ISO 3131, *Wood — Determination of density for physical and mechanical tests*

3 Symbols and units

k factor

σ is the standard deviation, expressed in kilograms per cubic metre

ρ is the density of the wood to which the test results should be applied, expressed in kilograms per cubic metre

ρ_{m} is the mean wood density to which the test results should be applied, expressed in kilograms per cubic metre

$\rho_{m,sel}$ is the mean wood density of all selected pieces to which the test results should be applied, expressed in kilograms per cubic metre

4 Timber sampling method and requirements

4.1 General

This International Standard specifies a method for the selection of wood of the required density.

The density shall be determined in accordance with ISO 3131, with mass and volume corresponding to equilibrium at a temperature of (20 ± 2) °C and relative humidity of (65 ± 5) %.

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If other conditions, such as tropical conditions, are used, they shall be permitted and reported. The data should be adjusted at the specific moisture content relative to those conditions.

4.2 Sampling method and requirements

The sampling method is based on the principle that all selected pieces have a density comparable with that of the wood to which the connection test results shall be applied. The test data may be used directly for calculating characteristic values, etc. of the joints.

NOTE The wood density relates to one wood species or a group of wood species.

The wood shall be of uniform quality and without localized defects that can influence the test results.

The wood density, ρ, of all selected pieces shall satisfy the condition given by Equation (1):

$$(1 - k)\rho_{\mathrm{m}} \leqslant \rho \leqslant (1 + k)\rho_{\mathrm{m}} \tag{1}$$

where

ρ_{m} is the mean density of the wood to which the test results are applied;

k is equal to 1,6 σ/ρ_{m} or 0,25 for cases where σ is unknown;

σ is the standard deviation of the wood to which the test results are applied.

The mean wood density, $\rho_{\mathrm{m,sel}}$, of all selected pieces shall satisfy the condition given by Equation (2):

$$0{,}95\rho_{\mathrm{m}} \leqslant \rho_{\mathrm{m,sel}} \leqslant 1{,}05\rho_{\mathrm{m}} \tag{2}$$

where

ρ_{m} is the mean density of the wood to which the test results are applied;

$\rho_{\mathrm{m,sel}}$ is the mean density of all selected pieces.

5 Test report

The following information shall be included in the test report:

a) reference to this International Standard, i.e. ISO 8970:2010;

b) the wood species or wood species group;

c) the moisture content at the time of selection;

d) the mean density including the (assumed) standard deviation of the wood to which the test result should be applied;

e) the density distribution of the selected pieces;

f) the mean density of all selected pieces;

g) confirmation that the selected pieces satisfy the conditions mentioned in this International Standard;

h) any other information which can influence the use of the test results.

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