INTERNATIONAL STANDARD

ISO
8970

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

Foreword

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Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council. They are approved in accordance with ISO procedures requiring at least 75 % approval by the member bodies voting.

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

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

1 Scope

This International Standard specifies two methods for the selection of wood density for specimens which are to be used in determining by testing the strength and stiffness properties of joints made with mechanical fasteners.

The two methods are equally applicable.

It is assumed that the wood density is normally distributed with a coefficient of variation of about 0,15.

It is emphasized that the density is only one of the properties influencing the strength of a joint. Other relevant properties are, for example, growth ring size and slope of grain.

2 Normative reference

The following standard contains provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the edition indicated was valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent edition of the standard indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 3131 : 1975, *Wood — Determination of density for physical and mechanical tests*.

3 General

This International Standard specifies two methods for the selection of wood density.

The first method is based on all specimens having a density comparable with the characteristic density of the timber to which the test result should be applied; normally the test data can be used directly for calculating characteristic values, etc. of the joints.

NOTE — The characteristic value of a material property corresponds in general to a fractile in the assumed statistical distribution of the particular property. The fractile — normally 0,05 or 0,5 — is specified in the relevant design standard.

The second method is aimed at getting specimens with a uniform density comparable with the mean density of the timber to which the test results should be applied; normally the characteristic values, etc. of the joints are calculated on the basis of corrected test values, F_{cor}, determined from the observed values, F_o, as

$$F_{cor} = F_o \left(\frac{\varrho_k}{\varrho}\right)^c$$

where

ϱ is the density of the wood in which failure took place;

ϱ_k is the required characteristic density for the timbers to which the test results should be applied;

c is a power depending on the influence of the wood properties on the properties of the joint. It should be determined by tests or from theoretical considerations.

4 Method 1

4.1   The wood should be of uniform quality and without localized defects that could influence the test results.

4.2   The mean density, ϱ_m, of all specimens should satisfy the following condition :

$$\varrho_m \leqslant 1,15 \, \varrho_k \qquad\qquad ... (1)$$

where ϱ_k is the required characteristic density for the timbers to which the test results should be applied, in kilograms per cubic metre, determined in accordance with ISO 3131 with mass and volume corresponding to equilibrium at a temperature of 20 °C ± 2 °C and relative humidity of (65 ± 5) %.

4.3   The density, ϱ, of at least 20 % of the specimens should satisfy the following condition :

$$\varrho \leqslant \varrho_k \qquad\qquad ... (2)$$

where ϱ_k is as in 4.2.

5 Method 2

5.1   The wood should be of uniform quality and without localized defects that could influence the test results.

5.2 The mean density, ϱ_m, of all specimens should satisfy the following conditions :

$$1{,}05 \, \varrho_k \leqslant \varrho_m \leqslant 1{,}25 \, \varrho_k \qquad \ldots (3)$$

where ϱ_k is the required characteristic density for the timbers to which the test results should be applied, in kilograms per cubic metre, determined in accordance with ISO 3131 with mass and volume corresponding to equilibrium at a temperature of 20 °C ± 2 °C and relative humidity of (65 ± 5) %.

5.3 The density, ϱ, of all single specimens should satisfy the following conditions :

$$0{,}9 \, \varrho_m \leqslant \varrho \leqslant 1{,}1 \, \varrho_m \qquad \ldots (4)$$

where ϱ_m is the mean density.