Plywood - Calculation method for some mechanical properties

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NATIONAL FOREWORD

See Eesti standard EVS-EN 14272:2011 sisaldab Euroopa standardi EN 14272:2011 ingliskeelset teksti.	This Estonian standard EVS-EN 14272:2011 consists of the English text of the European standard EN 14272:2011.
Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas.	This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation.
Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 21.12.2011.	Date of Availability of the European standard is 21.12.2011.
Standard on kättesaadav Eesti Standardikeskusest.	The standard is available from the Estonian Centre for Standardisation.

Tagasisidet standardi sisu kohta on võimalik edastada, kasutades EVS-i veebilehel asuvat tagasiside vormi või saates e-kirja meiliaadressile standardiosakond@evs.ee.

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English Version

Plywood - Calculation method for some mechanical properties

Contreplaqué - Méthode de calcul pour certaines caractéristiques mécaniques

Sperrholz - Rechenverfahren für einige mechanische Eigenschaften

This European Standard was approved by CEN on 1 October 2011.

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 CEN-CENELEC Management Centre or to any CEN member.

This European Standard exists 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 CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

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Foreword

This document (EN 14272:2011) has been prepared by Technical Committee CEN/TC 112 “Wood-based panels”, the secretariat of which is held by DIN.

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 June 2012, and conflicting national standards shall be withdrawn at the latest by June 2012.

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

This document supersedes ENV 14272:2002.

Annex A and Annex B are normative.

Compared to ENV 14272:2002, the following modifications have been made:

a) calculation applies to panels of any composition, symmetrical or not;

b) values resulting for the panels can be used for calculation as characteristics values as required by EN 1995-1-1;

c) new Annex A (normative) provides the derivation for the veneer values (basic values);

d) new Annex B (normative) provides practical spreadsheets to derive the properties;

e) new Annex C (informative) gives an example of bending strength.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

1 Scope

This European Standard specifies, for plywood panels of any composition, symmetrical or not, a calculation method to derive some mechanical properties (strength and stiffness in bending, tension, compression, panel and planar shear) as well as density from the wood compounding the layers.

NOTE Usually, the lay-up of the panels is symmetrical but, very often, the surface appearance of the face and the surface appearance of the back face differ, hence a difference between the mechanical properties of the respective veneers. Therefore, in this case, the composition is not mechanically symmetrical and a symmetry independent calculation method is needed.

Provided that structural characteristic values are taken for the layers, the resulting values for the panels can be used as characteristic values as required by EN 1995-1-1.

Conversely, Annex A defines the procedures to derive the veneer properties, in bending, tension and compression, either from testing panels according to EN 789 and EN 1058 or from timber testing according to EN 408 or from imposed values defined in EN 338.

Annex B provides practical spreadsheets, which are applications of the equations in the main part of this standard.

Annex C provide an example for the calculation of bending strength, in accordance with Annex B.

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.

EN 325, *Wood-based panels — Determination of dimensions of test pieces*

EN 338:2009, *Structural timber — Strength classes*

EN 384, *Structural timber — Determination of characteristic values of mechanical properties and density*

EN 408, *Timber structures — Structural timber and glued laminated timber — Determination of some physical and mechanical properties*

EN 789, *Timber structures — Test methods — Determination of mechanical properties of wood based panels*

EN 1058*, Wood-based panels — Determination of characteristic 5-percentile values and characteristic mean values*

EN 12369-2, *Wood-based panels — Characteristic values for structural design — Part 2 Plywood*

EN 14358, *Timber structures — Calculation of characteristic 5-percentile values and acceptance criteria for a sample*

3 Principle

Using the mechanical properties of the wood species, which compound the layers (in this standard referred to as veneer or basic values), it consists in deriving, by calculation, the mechanical properties of a panel.

For bending, tension and compression, each layer property value, along and across the length of the panel, is weighted by a geometrical factor related to its weight in the panel cross section.