DIN EN 14272:2012-03 (E)

Plywood - Calculation method for some mechanical properties

Contents

Page

Foreword 4

1 Scope 5

2 Normative references 5

3 Principle 5

4 Terms and definitions 6

5 Symbols 6
5.1 Main symbols 6
5.2 Subscripts 7

6 Calculation method 8
6.1 General 8
6.2 Properties relevant to the calculation methods 8
6.3 Wood species 8
6.4 Factors for plywood composition 8

7 Characteristic values for strength and stiffness in bending, tension and compression 11
7.1 General 11
7.2 Bending 11
7.2.1 General 11
7.2.2 Modulus of elasticity 11
7.2.3 Strength 11
7.3 Tension and compression 12
7.3.1 Stiffness and capacity of the layers in the cross section 12
7.3.2 Stiffness and capacity of the panel 13
7.3.3 Property of the panel (as if homogenized) 13
7.4 Property values for layers 13
7.4.1 General 13
7.4.2 Modulus of elasticity (, ... 14
7.4.3 Resistance 14

8 Shear properties 15
8.1 Panel shear 15
8.1.1 Panel shear rigidity (Gv) 15
8.1.2 Panel shear strength (fv) 16
8.2 Planar shear 16
8.2.1 General 16
8.2.2 Planar shear rigidity (Gr) 16
8.2.3 Planar shear strength (fr) 17

9 Ratio of strength upon modulus 17

10 Density 17

11 Conversion from strength and modulus of elasticity to capacity and stiffness 18

Annex A (normative) Derivation for the veneer values (or basic values) 19

A.1 Scope 19
A.2 Principle 19
A.2.1 Option 1: Using plywood test results 19
A.2.2 Option 2: Using solid timber properties 19
A.3 Procedure for derivation of properties from testing plywood 19
A.3.1 General 19
A.3.2 Sampling 20
A.3.3 Test pieces 20
A.3.4 Testing 20
A.3.5 Exploitation of the results 21
A.4 Derivation of estimated values for veneers 25
A.4.1 General 25
A.4.2 Values obtained by testing 25
A.4.3 Imposed values 25
A.5 Report 25

Annex B (normative) Practical spreadsheets to derive the properties 27

B.1 General 27
B.2 Bending 28
B.2.1 General 28
B.2.2 Main tables 28
B.2.3 Tables for strength values 31
B.3 Tension and compression 33
B.4 Panel shear 39
B.5 Planar shear 40
B.5.1 General 40
B.5.2 Available veneer values 40
B.5.3 Veneer values not available 42

Annex C (informative) Example of bending strength 43

C.1 Determination of the stress in the layers 43
C.2 Determination of the panel strength 45

Bibliography 47