

Timber structures — Structural timber and glued laminated timber — Determination of shear strength and mechanical properties perpendicular to the grain

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ICS 79.060.99; 91.080.20

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Foreword

This European Standard has been prepared by Technical Committee CEN/TC 124, Timber structures, the Secretariat of which is held by DS.

NOTE. It is considered desirable to maintain the same clause numbering throughout this series of standards. Consequently, some clauses are empty but it is envisaged that future editions may need to include text in these clauses.

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of an identical text or by endorsement, at the latest by April 1998, and conflicting national standards shall be withdrawn at the latest by April 1998.

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1 Scope

This standard specifies test methods for determining:

- tensile and compressive strengths perpendicular to the grain of structural timber and glued laminated timber; and
- tensile and compressive moduli of elasticity perpendicular to the grain of structural timber and glued laminated timber; and
- shear strength parallel to the grain of structural timber and of the laminates used in glued laminated timber.

2 Normative references

None.

3 Definitions

For the purposes of this standard, the following definitions apply:

3.1 compressive strength perpendicular to the grain

Stress corresponding to the load which occurs at the intersection of the line of the load/deformation curve and line 2 of figure 3.

3.2 modulus of elasticity in compression perpendicular to the grain

Property relating to the inclination of the straight line joining two points in figure 3 corresponding to the loads $0,1 F_{c,90,max}$ and $0,4 F_{c,90,max}$.

3.3 shear strength parallel to the grain

Maximum test load (F_{max}) per unit area of the test piece, multiplied by a factor of 0,97 (i.e. $\cos 14^\circ$).

4 Symbols

b	test piece width, in millimetres;
$E_{c,90}$	modulus of elasticity in compression perpendicular to the grain, in newtons per square millimetre;
$E_{t,90}$	modulus of elasticity in tension perpendicular to the grain, in newtons per square millimetre;
F	applied load, in newtons;
$F_{c,90}$	compressive load perpendicular to the grain, in newtons;
$F_{c,90,max}$	maximum compressive load perpendicular to the grain, in newtons;
$F_{c,90,max,est}$	estimated maximum compressive load perpendicular to the grain, in newtons;
$F_{t,90}$	tensile load perpendicular to the grain, in newtons;
$F_{t,90,max}$	maximum tensile load perpendicular to the grain, in newtons;

F_{max}	maximum load applied by the test machine, in newtons;
$f_{c,90}$	compressive strength perpendicular to the grain, in newtons per square millimetre;
$f_{t,90}$	tensile strength perpendicular to the grain, in newtons per square millimetre;
f_v	shear strength parallel to the grain, in newtons per square millimetre;
h	test piece height, in millimetres;
h_0	gauge length, in millimetres;
l	test piece length, in millimetres;
t	plate thickness, in millimetres;
w	deformation, in millimetres.

5 Determination of dimensions of test piece

The dimensions of the test pieces shall be measured to an accuracy of 1 %. All measurements shall be made when the test pieces are conditioned as specified in clause 7, and planed.

NOTE. If the width or length varies, then these dimensions should be recorded as the average of three measurements on the height of the test piece.

6 Determination of density of test pieces

The density of the test pieces shall be determined prior to test from the measurements of mass and volume of the whole test piece.

7 Conditioning of test pieces

7.1 General

The tests shall be carried out on test pieces which are conditioned at the standard environment of $(20 \pm 2)^\circ\text{C}$ and $(65 \pm 5)\%$ relative humidity. The test piece is conditioned when it attains constant mass. Constant mass is considered to be attained when the results of two successive weighings, carried out at an interval of 6 h, do not differ by more than 0,1 % of the mass of the test piece.

Where the timber to be tested is not readily conditionable to the above standard environment, (e.g. for hardwoods with high densities), that fact shall be reported.

7.2 Test area environment

Unless otherwise protected, test pieces shall not be removed from the conditioning environment more than 1 h before testing.

NOTE. Test pieces can be stored in the test area for up to 24 h provided they are close piled and wrapped in vapour tight sheeting.