

DIN EN 1995-1-1:2026-09 (E)

Eurocode 5 - Design of timber structures - Part 1-1: General rules and rules for buildings

Contents

Page

European foreword	6
0 Introduction.....	8
1 Scope	10
1.1 Scope of EN 1995-1-1	10
1.2 Assumptions	10
2 Normative references.....	10
3 Terms, definitions and symbols	11
3.1 Terms and definitions.....	11
3.2 Symbols and abbreviations.....	20
4 Basis of design.....	44
4.1 General rules	44
4.2 Principles of limit state design	45
4.3 Basic variables	45
4.4 Stiffness values for structural analysis	49
4.5 Verification by the partial factor method	51
5 Materials	54
5.1 Strength and stiffness properties	54
5.2 Modification factors for service classes and load-duration	57
5.3 Modification factors for size effects	61
5.4 Specific material properties	62
5.5 Shrinkage and swelling values.....	63
6 Durability.....	65
6.1 General	65
6.2 Measures to prevent a biological attack.....	65
6.3 Resistance to corrosion of metal fasteners and connectors	67
7 Structural analysis	73
7.1 General	73
7.2 Structural modelling.....	74
7.3 Structural analysis at system and member levels	75
7.4 Magnitude of equivalent imperfections and equivalent actions	76
7.5 Bracing.....	82
7.6 Analysis of assemblies sensitive for the load cases handling, transport and erection	85
8 Ultimate limit states	86
8.1 Member resistance verification.....	86
8.2 Member buckling verification.....	104
8.3 Additional provisions for members with special geometries	109
8.4 Beams with composite cross-section.....	137
8.5 System strength.....	141
9 Serviceability limit states	142
9.1 General	142
9.2 Deformations.....	142
9.3 Vibrations	145
9.4 Compressive deformation perpendicular to grain.....	157

10	Fatigue	158
10.1	General	158
10.2	Fatigue verification for equivalent constant amplitude fatigue loading	159
10.3	Fatigue verification for variable amplitude fatigue loading	161
11	Connections	161
11.1	General	161
11.2	Resistance of a single dowel-type fastener	163
11.3	Connection design with dowel-type fasteners	185
11.4	Spacings, edge and end distances	202
11.5	Brittle failure modes of connections with dowel-type fasteners loaded parallel to grain	212
11.6	Brittle failure of connections loaded perpendicular to grain	220
11.7	Shear connectors	225
11.8	Punched metal plate fasteners	233
11.9	Expanded tube fasteners	233
11.10	Bonded-in rods	233
11.11	Carpentry connections	241
12	Diaphragms	250
12.1	General	250
12.2	Framed diaphragms	251
12.3	Framed wall diaphragms	258
12.4	Framed floor diaphragms	266
12.5	Framed roof diaphragms	276
12.6	Diaphragms built out of CLT, LVL and GLVL	276
13	Timber foundation piles	278
	Annex A (informative) Additional guidance to Basis of design	279
A.1	Use of this annex	279
A.2	Scope and field of application	279
A.3	Additional guidance for increasing the robustness of timber structures	279
	Annex B (informative) Additional information to Structural Analysis	282
B.1	Use of this annex	282
B.2	Scope and field of application	282
B.3	Stability and bracing of members and structural systems	282
B.4	Buckling of beam columns - non-linear method	307
B.5	Mechanically jointed members	316
	Annex C (normative) Additional provisions to Ultimate Limit States	321
C.1	Use of this annex	321
C.2	Scope and field of application	321
C.3	Additional design provisions for cross laminated timber (CLT)	321
C.4	Laminated timber decks (LTD)	329
	Annex D (informative) Additional information to Ultimate Limit States	336
D.1	Use of this annex	336
D.2	Scope and field of application	336

D.3	Built-up columns.....	336
	Annex E (informative) Additional information to Serviceability Limit States	344
E.1	Use of this annex	344
E.2	Scope and field of application	344
E.3	General method for vibration analysis of floors	344
	Annex F (normative) Additional provisions to Connections.....	350
F.1	Use of this annex	350
F.2	Scope and field of application	350
F.3	Connections with punched metal plate fasteners (PMPF).....	350
F.4	Connections with interlayers	366
	Annex G (informative) Additional information to Connections.....	378
G.1	Use of this annex	378
G.2	Scope and field of application	378
G.3	Connections with three-dimensional connectors.....	378
G.4	Connections with expanded tube fasteners	383
	Annex H (informative) Additional information to Diaphragms.....	391
H.1	Use of this annex	391
H.2	Scope and field of application	391
H.3	Lateral displacement of multi story diaphragms built out of CLT, LVL and GLVL (monolithic shear walls) and single segmented monolithic shear walls	391
H.4	Framed walls with combined anchorage	400
	Annex I (informative) Information on Timber Foundation Piles.....	407
I.1	Use of this annex	407
I.2	Scope and field of application	407
I.3	Timber foundation piles	407
I.4	Requirements for timber logs and pile extensions used as foundation piles.....	413
	Annex M (normative) Material and product properties for design.....	418
M.1	Use of this annex	418
M.2	Scope and field of application	418
M.3	Timber products	418
M.4	Gypsum plasterboard (GPB) and gypsum fibreboard (GFB)	425
M.5	Insulation products.....	426
M.6	Fasteners and connectors.....	426
M.7	Timber foundation piles	432
	Annex N (informative) Additional information on material and product properties for design.....	434
N.1	Use of this annex	434
N.2	Scope and field of application	434

N.3	Strength categories for cross laminated timber (CLT)	434
N.4	Strength categories for laminated veneer lumber (LVL)	435
N.5	Characteristic strength and stiffness values of gypsum plasterboard and fibreboard....	438
N.6	Categories for screws and rods with wood screw thread	440
	Bibliography	442