

Table 3 — Strength classes for hardwoods based on edgewise bending tests – strength, stiffness and density values

	Class	D18	D24	D27	D30	D35	D40	D45	D50	D55	D60	D65	D70	D75	D80
Strength properties in N/mm²															
Bending	$f_{m,k}$	18	24	27	30	35	40	45	50	55	60	65	70	75	80
Tension parallel	$f_{t0,k}$	11	14	16	18	21	24	27	30	33	36	39	42	45	48
Tension perpendicular	$f_{t90,k}$	0,6	0,6	0,6	0,6	0,6	0,6	0,6	0,6	0,6	0,6	0,6	0,6	0,6	0,6
Compression parallel	$f_{c0,k}$	18	21	22	24	25	27	29	30	32	33	35	36	37	38
Compression perpendicular	$f_{c90,k}$	4,8	4,9	5,1	5,3	5,4	5,5	5,8	6,2	6,6	10,5	11,3	12,0	12,8	13,5
Shear	$f_{v,k}$	3,5	3,7	3,8	3,9	4,1	4,2	4,4	4,5	4,7	4,8	5,0	5,0	5,0	5,0
Stiffness properties in kN/mm²															
Mean modulus of elasticity parallel bending	$E_{m,0,mean}$	9,5	10,0	10,5	11,0	12,0	13,0	13,5	14,0	15,5	17,0	18,5	20,0	22,0	24,0
5 percentile modulus of elasticity parallel bending	$E_{m,0,k}$	8,0	8,4	8,8	9,2	10,1	10,9	11,3	11,8	13,0	14,3	15,5	16,8	18,5	20,2
Mean modulus of elasticity perpendicular	$E_{m,90,mean}$	0,63	0,67	0,70	0,73	0,80	0,87	0,90	0,93	1,03	1,13	1,23	1,33	1,47	1,60
Mean shear modulus	G_{mean}	0,59	0,63	0,66	0,69	0,75	0,81	0,84	0,88	0,97	1,06	1,16	1,25	1,38	1,50
Density in kg/m³															
5 percentile density	ρ_k	475	485	510	530	540	550	580	620	660	700	750	800	850	900
Mean density	ρ_{mean}	570	580	610	640	650	660	700	740	790	840	900	960	1020	1080
NOTE 1 Values given above for tension strength, compression strength, shear strength, char. modulus of elasticity in bending, mean modulus of elasticity perpendicular to grain and mean shear modulus, have been calculated using the equations given in EN 384.															
NOTE 2 The tabulated properties are compatible with timber at moisture content consistent with a temperature of 20 °C and a relative humidity of 65 %, which corresponds to a moisture content of 12 % for most species.															
NOTE 3 Characteristic values for shear strength are given for timber without fissures, according to EN 408.															
NOTE 4 The edgewise bending strength may also be used in the case of flatwise bending.															