2.7 Dry and wet exposure conditions

The terms 'dry' and 'wet' refer to the exposure conditions that will exist when the timber is in service, and relate to the moisture content of such timber. Hence dry exposure timber will have an average moisture content not exceeding 18 per cent. This exposure includes most covered buildings and internal uses. Wet exposure timber will have an average moisture content greater than 18 per cent. Such timber would generally be in an external environment or in contact with water.

The grade stresses given in Table 2.2 are for timber in the dry exposure condition. These are reduced in the wet state by multiplying by the appropriate K_2 factor from BS 5268 Table 16, reproduced here as Table 2.3.

Table 2.3 Modification factor K_2 by which dry stresses and moduli should be multiplied to obtain wet stresses and moduli applicable to wet exposure conditions (BS 5268 Part 2 1988 Table 16)

Property	Value of K_2
Bending parallel to grain	0.8
Tension parallel to grain	0.8
Compression parallel to grain	0.6
Compression perpendicular to grain	0.6
Shear parallel to grain	0.9
Mean and minimum modulus of elasticity	0.8

2.8 Geometrical properties of timber

The geometrical properties for sawn, planed all round and regularized softwoods are given in Tables 98, 99 and 100 respectively of BS 5268. That for sawn softwoods is reproduced here as Table 2.4.

The tables relate to timber in the dry exposure condition. For timber in the wet exposure condition the values contained in the tables should be multiplied by the relevant K_1 factor, obtained from Table 2 of BS 5268 and reproduced here as Table 2.5. This has the effect of increasing the geometrical properties induced by swelling of the timber when wet.

2.9 Duration of load

The grade stresses given in Table 2.2 are applicable to timber members supporting permanent loads. However, a timber member can support a greater load for a short period than it can permanently. This fact is allowed for in design by adjusting the grade stresses using an appropriate load duration factor K_3 from BS 5268 Table 17, which is reproduced here as Table 2.6.

2.10 Load sharing systems

A load sharing system is said to exist when a minimum of four members, such as rafters, joists, trusses or wall studs, are placed at centres not exceeding 610 mm and adequate provision is made for the lateral distribution of the applied loads via purlins, binders, boards or battens.

In such instances, a 10 per cent increase in the appropriate grade stress

Table 2.4 Geometrical properties of sawn softwoods (BS 5268 Part 2 1988 Table 98)

Basic size*	Area	Section modulus		Second moment of area		Radius of gyration	
		About x–x	About y–y	About x–x	About y–y	About x–x	About y–y
(mm)	(10^3 mm^2)	(10^3 mm^3)	(10^3 mm^3)	(10^6 mm^4)	(10^6 mm^4)	(mm)	(mm)
36 × 75	2.70	33.8	16.2	1.27	0.292	21.7	10.4
36 × 100	3.60	60.0	21.6	3.00	0.389	28.9	10.4
36 × 125	4.50	93.8	27.0	5.86	0.486	36.1	10.4
36 × 150	5.40	135	32.4	10.1	0.583	43.3	10.4
38 × 75	2.85	35.6	18.1	1.34	0.343	21.7	11.0
38 × 100	3.80	63.3	24.1	3.17	0.457	28.9	11.0
38 × 125	4.75	99.0	30.1	6.18	0.572	36.1	11.0
38 × 150	5.70	143	36.1	10.7	0.686	43.3	11.0
38 × 175	6.65	194	42.1	17.0	0.800	50.5	11.0
38 × 200	7.60	253	48.1	25.3	0.915	57.7	11.0
38 × 225	8.55	321	54.2	36.1	1.03	65.0	11.0
44 × 75	3.30	41.3	24.2	1.55	0.532	21.7	12.7
44 × 100	4.40	73.3	32.3	3.67	0.710	28.9	12.7
44 × 125	5.50	115	40.3	7.16	0.887	36.1	12.7
44 × 150	6.60	165	48.4	12.4	1.06	43.3	12.7
44 × 175	7.70	225	56.5	19.7	1.24	50.5	12.7
44 × 200	8.80	293	64.5	29.3	1.42	57.7	12.7
44 × 225	9.90	371	72.6	41.8	1.60	65.0	12.7
44 × 250	11.0	458	80.7	57.3	1.77	72.2	12.7
44 × 300	13.2	660	96.8	99.0	2.13	86.6	12.7
47 × 75	3.53	44.1	27.6	1.65	0.649	21.7	13.6
47 × 100	4.70	78.3	36.8	3.92	0.865	28.9	13.6
47 × 125	5.88	122	46.0	7.65	1.08	36.1	13.6
47 × 150	7.05	176	55.2	13.2	1.30	43.3	13.6
47 × 175	8.23	240	64.4	21.0	1.51	50.5	13.6
47 × 200	9.40	313	73.6	31.3	1.73	57.7	13.6
47 × 225	10.6	397	82.8	44.6	1.95	65.0	13.6
47 × 250	11.8	490	92.0	61.2	2.16	72.2	13.6
47 × 300	14.1	705	110	106	2.60	86.6	13.6
50 × 75	3.75	46.9	31.3	1.76	0.781	21.7	14.4
50 × 100	5.00	83.3	41.7	4.17	1.04	28.9	14.4
50 × 125	6.25	130	52.1	8.14	1.30	36.1	14.4
50 × 150	7.50	188	62.5	14.1	1.56	43.3	14.4
50 × 175	8.75	255	72.9	22.3	1.82	50.5	14.4
50 × 200	10.0	333	83.3	33.3	2.08	57.7	14.4
50 × 225	11.3	422	93.8	47.5	2.34	65.0	14.4
50 × 250	12.5	521	104	65.1	2.60	72.2	14.4
50 × 300	15.0	750	125	113	3.13	86.6	14.4
63 × 100	6.30	105	66.2	5.25	2.08	28.9	18.2
63 × 125	7.88	164	82.7	10.3	2.60	36.1	18.2
63 × 150	9.45	236	99.2	17.7	3.13	43.3	18.2
63 × 175	11.0	322	116	28.1	3.65	50.5	18.2
63 × 200	12.6	420	132	42.0	4.17	57.7	18.2
63 × 225	14.2	532	149	59.8	4.69	65.0	18.2