BSW Timber

Strength Graded Timber & Span Tables

A step-by-step guide from BSW Timber

Strength Grading and Class

- BSW construction products are frequently used timbers for loadbearing situations such as floor joists and wall studs (sometimes referred to as “carcassing”). In order to comply with the Building Regulations they must always be strength graded: they are then usually put into a Strength Class.
- Strength Grading of BSW construction timbers is often done by machine to British Standard EN 14081 to classes C16 or C24. There are actually 12 Strength Classes available in Europe, but the UK mainly uses C16 and C24.
- BSW construction timbers are clearly marked with a legally required stamp to help you identify that the products have been graded. The picture below explains the stamp markings.
- In your project if strength graded timber is cut to length, there will be no problem - its grade is unaffected. However, if a piece of graded timber is resawn in its cross-section, then its original strength grade is destroyed. Both of the resawn sections must be re-graded before being used for any structural purpose.
- The Strength Class of the timber is very important when determining which joist to use for your project. It will help you identify which dimensions of timber to use for a particular span and loading situation.

BSW machined kiln dried strength graded construction timbers are available in the following sizes:

Nominal Sizes (mm)	Finished Sizes (mm)	Lengths (mm)
47 x 75*	45 x 70	2400
47 x 100	45 x 95	3000
47 x 125	45 x 120	3600
47 x 150	45 x 145	4200
47 x 175	45 x 170	4800
47 x 200	45 x 195	5400
47 x 225	45 x 220	
75 x 100	72 x 95	
75 x 150	72 x 145	
75 x 175	72 x 170	
75 x 200	72 x 195	
75 x 225	72 x 220	

*47 x 75 KD Ungraded

Joist Spans and Supports

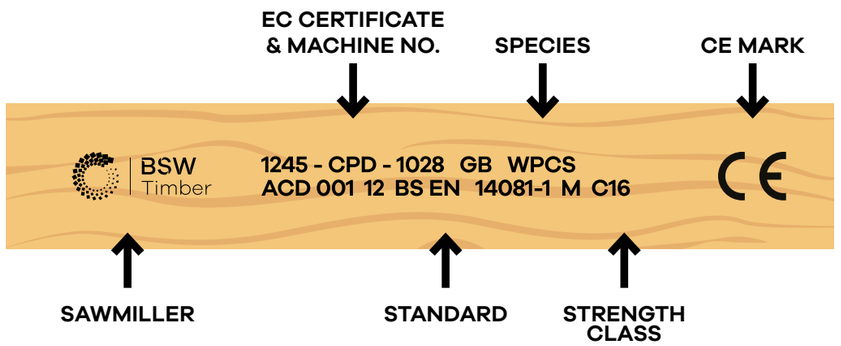
- A “joist span” means the “clear” distance that it carries over, rather than the overall length of the piece of joist timber. But of course, as well as the distance to be “bridged”, both ends of the joist must be properly supported. For example, a clear span of 3 metres will actually require a timber member in the order of 3.3 metres long. This will have 100-150mm of timber at each end, resting on some form of support: and this may be a wall made of brick or block, or maybe a timber stud frame – or it could be a joist hanger.
- A joist hanger is a specially-made metal “shoe” designed to cradle the joist end which provides support plus a rigid fixing. By nailing the joist into the hanger, it prevents rotation of the joist and therefore limits overall deflection.
- Span tables are used to select which BSW joist is needed for a particular span. The four key factors for selecting what timber to use are shown in the diagram below; joist size, joist centres, loading and distance to be spanned.

	Spans primarily for ground floors			
C/C Joist (JOIST SIZE ↓)	Less than 0.25kN/m² (← LOADING)			
Joist ref	400	1824	2438	2705
45 x 95mm	1930	2492	2941	3138
45 x 120mm	2593	3006	3443	3565
45 x 145mm	3127	3518	3943	3988
45 x 170mm	3659	4029	4441	
45 x 195mm	4189	4537	600	
45 x 220mm	4698	480	1473	

← JOIST CENTRES

← DISTANCE TO BE SPANNED

Illustration of the grade stamp



C16 Span Table
Domestic Ceiling Joists

Imposed load not exceeding q_k = 0.25 kN/m² and Q_k = 0.9 kN.

C16	Dead load G_k per square metre excluding weight of joist					
	G_k not more than 0.25 kN/m²			G_k not more than 0.5 kN/m²		
	Centre-to-centre spacing of joists					
Joist size (breadth x depth)	400 mm	450 mm	600 mm	400 mm	450 mm	600 mm
	Maximum clear span in metres					
38 x 89 mm	1.50	1.49	1.44	1.43	1.41	1.35
38 x 140 mm	2.74	2.70	2.58	2.55	2.50	2.37
38 x 184 mm	3.86	3.78	3.59	3.55	3.47	3.27
38 x 235 mm	5.16	5.06	4.78	4.72	4.60	4.31
45 x 95 mm	1.78	1.76	1.69	1.68	1.65	1.58
45 x 120 mm	2.42	2.38	2.29	2.26	2.22	2.11
45 x 145 mm	3.08	3.03	2.89	2.86	2.80	2.65
45 x 170 mm	3.75	3.68	3.50	3.46	3.38	3.19
45 x 195 mm	4.42	4.33	4.11	4.06	3.97	3.73
45 x 220 mm	5.09	4.99	4.72	4.67	4.55	4.27
72 x 120 mm	2.95	2.90	2.77	2.75	2.69	2.55
72 x 145 mm	3.72	3.65	3.48	3.44	3.37	3.18
72 x 170 mm	4.49	4.40	4.18	4.14	4.04	3.80
72 x 195 mm	5.26	5.15	4.88	4.83	4.71	4.43
72 x 220 mm	6.02	5.90	5.58	5.51	5.38	5.05
89 x 184 mm	5.30	5.20	4.93	4.87	4.76	4.48
89 x 235 mm	6.93	6.79	6.43	6.35	6.20	5.82

The above table provides a general summary of common permissible clear spans of simply supported domestic ceiling joists of solid timber for specified loadings, sizes and spacings. The table is solely for guidance on the loadbearing capacity of solid timber members, and cannot be adapted for hardwoods or engineered timber products. In preparing this table, Timber Development UK has assumed the complete design and build will be delivered by competent people and that thorough engineering calculations will be undertaken to verify the guidance provided above for each specific circumstance.

C24 Span Table
Domestic Ceiling Joists

Imposed load not exceeding q_k = 0.25 kN/m² and Q_k = 0.9 kN.

C24	Dead load G_k per square metre excluding weight of joist					
	G_k not more than 0.25 kN/m²			G_k not more than 0.5 kN/m²		
	Centre-to-centre spacing of joists					
Joist size (breadth x depth)	400 mm	450 mm	600 mm	400 mm	450 mm	600 mm
	Maximum clear span in metres					
38 x 89 mm	1.75	1.72	1.67	1.65	1.62	1.55
38 x 140 mm	3.15	3.09	2.95	2.92	2.86	2.70
38 x 184 mm	4.39	4.31	4.09	4.04	3.94	3.70
38 x 235 mm	5.85	5.72	5.40	5.34	5.20	4.87
45 x 95 mm	2.06	2.03	1.95	1.93	1.90	1.81
45 x 120 mm	2.78	2.73	2.62	2.59	2.54	2.41
45 x 145 mm	3.52	3.46	3.29	3.26	3.19	3.01
45 x 170 mm	4.27	4.19	3.97	3.93	3.84	3.61
45 x 195 mm	5.02	4.92	4.65	4.60	4.49	4.21
45 x 220 mm	5.76	5.64	5.33	5.27	5.14	4.81
72 x 120 mm	3.37	3.31	3.16	3.12	3.06	2.89
72 x 145 mm	4.22	4.14	3.94	3.90	3.81	3.59
72 x 170 mm	5.08	4.98	4.72	4.67	4.56	4.29
72 x 195 mm	5.93	5.81	5.50	5.44	5.30	4.98
72 x 220 mm	6.76	6.63	6.27	6.19	6.04	5.67
89 x 184 mm	5.96	5.85	5.54	5.48	5.35	5.03
89 x 235 mm	7.74	7.59	7.19	7.11	6.94	6.51

The above table provides a general summary of common permissible clear spans of simply supported domestic ceiling joists of solid timber for specified loadings, sizes and spacings. The table is solely for guidance on the loadbearing capacity of solid timber members, and cannot be adapted for hardwoods or engineered timber products. In preparing this table, Timber Development UK has assumed the complete design and build will be delivered by competent people and that thorough engineering calculations will be undertaken to verify the guidance provided above for each specific circumstance.

C16 Span Table
Domestic Flat Roof Joists

Access for maintenance and repair only.
Imposed load not exceeding q_k = 0.6 kN/m² or Q_k = 0.9 kN or "slab loading".

C16	Dead load G_k per square metre excluding weight of joist								
	G_k not more than 0.5 kN/m²			G_k not more than 0.75 kN/m²			G_k not more than 1.0 kN/m²		
	Centre-to-centre spacing of joists								
Joist size (breadth x depth)	400 mm	450 mm	600 mm	400 mm	450 mm	600 mm	400 mm	450 mm	600 mm
	Maximum clear span in metres								
38 x 89 mm	1.48	1.46	1.41	1.41	1.39	1.33	1.35	1.33	1.26
38 x 140 mm	2.68	2.63	2.51	2.51	2.45	2.32	2.37	2.32	2.18
38 x 184 mm	3.75	3.67	3.48	3.48	3.40	3.19	3.27	3.19	2.98
38 x 235 mm	5.01	4.90	4.53	4.61	4.49	4.18	4.32	4.20	3.91
45 x 95 mm	1.75	1.72	1.65	1.65	1.63	1.55	1.58	1.55	1.47
45 x 120 mm	2.36	2.33	2.22	2.22	2.18	2.06	2.11	2.06	1.95
45 x 145 mm	3.00	2.95	2.80	2.80	2.74	2.58	2.65	2.58	2.42
45 x 170 mm	3.65	3.57	3.39	3.39	3.31	3.11	3.19	3.11	2.91
45 x 195 mm	4.29	4.20	3.97	3.97	3.88	3.63	3.73	3.63	3.39
45 x 220 mm	4.94	4.83	4.48	4.56	4.44	4.14	4.28	4.16	3.87
72 x 120 mm	2.88	2.83	2.70	2.69	2.64	2.49	2.55	2.49	2.34
72 x 145 mm	3.62	3.55	3.37	3.37	3.29	3.10	3.18	3.10	2.90
72 x 170 mm	4.36	4.27	4.04	4.05	3.95	3.71	3.81	3.71	3.46
72 x 195 mm	5.11	5.00	4.62	4.72	4.61	4.28	4.44	4.32	4.02
72 x 220 mm	5.84	5.67	5.19	5.39	5.25	4.82	5.06	4.92	4.53
89 x 184 mm	5.15	5.04	4.66	4.77	4.65	4.33	4.48	4.37	4.07
89 x 235 mm	6.64	6.42	5.90	6.19	5.98	5.49	5.83	5.64	5.17

The above table provides a general summary of common permissible clear spans of flat roof joists of solid timber for specified loadings, sizes and spacings. The table is solely for guidance on the loadbearing capacity of solid timber members, and cannot be adapted for hardwoods or engineered timber products. In preparing this table, Timber Development UK has assumed the complete design and build will be delivered by competent people and that thorough engineering calculations will be undertaken to verify the guidance provided above for each specific circumstance.

C24 Span Table
Domestic Flat Roof Joists

Access for maintenance and repair only.
Imposed load not exceeding q_k = 0.6 kN/m² or Q_k = 0.9 kN or "slab loading".

C24	Dead load G_k per square metre excluding weight of joist								
	G_k not more than 0.25 kN/m²			G_k not more than 0.5 kN/m²			G_k not more than 1.25 kN/m²		
	Centre-to-centre spacing of joists								
Joist size (breadth x depth)	400 mm	450 mm	600 mm	400 mm	450 mm	600 mm	400 mm	450 mm	600 mm
	Maximum clear span in metres								
38 x 89 mm	1.71	1.69	1.63	1.63	1.60	1.53	1.56	1.53	1.45
38 x 140 mm	3.07	3.01	2.86	2.86	2.80	2.64	2.70	2.64	2.47
38 x 184 mm	4.27	4.18	3.95	3.95	3.85	3.61	3.71	3.61	3.37
38 x 235 mm	5.67	5.51	5.04	5.21	5.08	4.66	4.88	4.74	4.37
45 x 95 mm	2.01	1.98	1.90	1.90	1.87	1.78	1.81	1.78	1.68
45 x 120 mm	2.71	2.67	2.54	2.54	2.49	2.35	2.41	2.35	2.21
45 x 145 mm	3.43	3.36	3.19	3.19	3.12	2.94	3.01	2.94	2.75
45 x 170 mm	4.15	4.06	3.84	3.84	3.75	3.52	3.61	3.52	3.29
45 x 195 mm	4.87	4.76	4.43	4.50	4.38	4.10	4.22	4.10	3.82
45 x 220 mm	5.59	5.45	4.98	5.15	5.01	4.61	4.82	4.69	4.33
72 x 120 mm	3.28	3.22	3.06	3.06	3.00	2.83	2.90	2.83	2.65
72 x 145 mm	4.11	4.03	3.82	3.82	3.73	3.50	3.60	3.50	3.28
72 x 170 mm	4.93	4.83	4.49	4.57	4.46	4.16	4.29	4.18	3.90
72 x 195 mm	5.75	5.59	5.13	5.31	5.18	4.76	4.99	4.85	4.48
72 x 220 mm	6.49	6.27	5.76	6.05	5.84	5.35	5.68	5.51	5.04
89 x 184 mm	5.79	5.63	5.17	5.36	5.23	4.80	5.04	4.90	4.52
89 x 235 mm	7.33	7.10	6.54	6.85	6.62	6.08	6.48	6.26	5.73

The above table provides a general summary of common permissible clear spans of flat roof joists of solid timber for specified loadings, sizes and spacings. The table is solely for guidance on the loadbearing capacity of solid timber members, and cannot be adapted for hardwoods or engineered timber products. In preparing this table, Timber Development UK has assumed the complete design and build will be delivered by competent people and that thorough engineering calculations will be undertaken to verify the guidance provided above for each specific circumstance.

C16 Span Table
Domestic Flat Roof Joists

Access for maintenance and repair only.
Imposed load not exceeding q_k = 1.02 kN/m² or Q_k = 0.9 kN.

C16	Dead load G_k per square metre excluding weight of joist								
	G_k not more than 0.5 kN/m²			G_k not more than 0.75 kN/m²			G_k not more than 1.0 kN/m²		
	Centre-to-centre spacing of joists								
Joist size (breadth x depth)	400 mm	450 mm	600 mm	400 mm	450 mm	600 mm	400 mm	450 mm	600 mm
	Maximum clear span in metres								
38 x 89 mm	1.48	1.46	1.41	1.41	1.39	1.33	1.35	1.33	1.26
38 x 140 mm	2.68	2.63	2.48	2.51	2.45	2.32	2.37	2.32	2.18
38 x 184 mm	3.71	3.57	3.25	3.48	3.36	3.05	3.27	3.19	2.89
38 x 235 mm	4.72	4.55	4.14	4.44	4.28	3.89	4.22	4.06	3.69
45 x 95 mm	1.75	1.72	1.65	1.65	1.63	1.55	1.58	1.55	1.47
45 x 120 mm	2.36	2.33	2.22	2.22	2.18	2.06	2.11	2.06	1.95
45 x 145 mm	3.00	2.95	2.72	2.80	2.74	2.55	2.65	2.58	2.42
45 x 170 mm	3.63	3.50	3.18	3.39	3.29	2.99	3.19	3.11	2.83
45 x 195 mm	4.15	4.00	3.64	3.91	3.76	3.42	3.71	3.57	3.24
45 x 220 mm	4.67	4.50	4.10	4.40	4.23	3.85	4.18	4.02	3.66
72 x 120 mm	2.88	2.83	2.63	2.69	2.64	2.47	2.55	2.49	2.34
72 x 145 mm	3.61	3.48	3.17	3.37	3.27	2.98	3.18	3.10	2.83
72 x 170 mm	4.21	4.06	3.71	3.97	3.82	3.49	3.78	3.64	3.31
72 x 195 mm	4.81	4.64	4.24	4.54	4.37	3.99	4.32	4.16	3.79
72 x 220 mm	5.41	5.21	4.77	5.10	4.92	4.49	4.86	4.68	4.27
89 x 184 mm	4.85	4.68	4.28	4.58	4.42	4.04	4.36	4.20	3.83
89 x 235 mm	6.13	5.92	5.43	5.80	5.60	5.12	5.53	5.33	4.87

The above table provides a general summary of common permissible clear spans of flat roof joists of solid timber for specified loadings, sizes and spacings. The table is solely for guidance on the loadbearing capacity of solid timber members, and cannot be adapted for hardwoods or engineered timber products. In preparing this table, Timber Development UK has assumed the complete design and build will be delivered by competent people and that thorough engineering calculations will be undertaken to verify the guidance provided above for each specific circumstance.

C24 Span Table
Domestic Flat Roof Joists

Access for maintenance and repair only.
Imposed load not exceeding q_k = 1.02 kN/m² or Q_k = 0.9 kN.

C24	Dead load G_k per square metre excluding weight of joist								
	G_k not more than 0.5 kN/m²			G_k not more than 0.75 kN/m²			G_k not more than 1.0 kN/m²		
	Centre-to-centre spacing of joists								
Joist size (breadth x depth)	400 mm	450 mm	600 mm	400 mm	450 mm	600 mm	400 mm	450 mm	600 mm
	Maximum clear span in metres								
38 x 89 mm	1.71	1.69	1.63	1.63	1.60	1.53	1.56	1.53	1.45
38 x 140 mm	3.07	3.01	2.76	2.86	2.80	2.60	2.70	2.64	2.46
38 x 184 mm	4.13	3.98	3.62	3.89	3.74	3.40	3.69	3.55	3.23
38 x 235 mm	5.25	5.06	4.61	4.94	4.76	4.33	4.70	4.52	4.11
45 x 95 mm	2.01	1.98	1.90	1.90	1.87	1.78	1.81	1.78	1.68
45 x 120 mm	2.71	2.67	2.51	2.54	2.49	2.35	2.41	2.35	2.21
45 x 145 mm	3.43	3.32	3.03	3.19	3.12	2.84	3.01	2.94	2.70
45 x 170 mm	4.03	3.89	3.54	3.80	3.66	3.33	3.61	3.47	3.16
45 x 195 mm	4.61	4.45	4.05	4.35	4.18	3.81	4.13	3.97	3.62
45 x 220 mm	5.19	5.00	4.56	4.89	4.71	4.29	4.65	4.47	4.07
72 x 120 mm	3.28	3.21	2.93	3.06	3.00	2.75	2.90	2.83	2.61
72 x 145 mm	4.00	3.86	3.52	3.78	3.64	3.32	3.59	3.46	3.15
72 x 170 mm	4.67	4.51	4.12	4.41	4.25	3.88	4.20	4.04	3.68
72 x 195 mm	5.34	5.15	4.71	5.04	4.86	4.44	4.80	4.62	4.22
72 x 220 mm	5.99	5.78	5.30	5.66	5.46	4.99	5.39	5.20	4.75
89 x 184 mm	5.38	5.19	4.75	5.08	4.90	4.48	4.84	4.67	4.26
89 x 235 mm	6.79	6.56	6.02	6.43	6.21	5.69	6.13	5.92	5.41

The above table provides a general summary of common permissible clear spans of flat roof joists of solid timber for specified loadings, sizes and spacings. The table is solely for guidance on the loadbearing capacity of solid timber members, and cannot be adapted for hardwoods or engineered timber products. In preparing this table, Timber Development UK has assumed the complete design and build will be delivered by competent people and that thorough engineering calculations will be undertaken to verify the guidance provided above for each specific circumstance.

C16 Span Table
Domestic Floor Joists

Access for maintenance and repair only.
Imposed load not exceeding q_k = 1.02 kN/m² or Q_k = 0.9 kN.

C16	Dead load G_k per square metre excluding weight of joist								
	G_k not more than 0.25 kN/m²			G_k not more than 0.5 kN/m²			G_k not more than 1.25 kN/m²		
	Centre-to-centre spacing of joists								
Joist size (breadth x depth)	400 mm	450 mm	600 mm	400 mm	450 mm	600 mm	400 mm	450 mm	600 mm
	Maximum clear span in metres								
38 x 89 mm	1.60	1.60	1.36	1.60	1.60	1.28	1.46	1.38	1.10
38 x 140 mm	2.52	2.52	2.43	2.52	2.52	2.29	2.29	2.20	1.99
38 x 184 mm	3.31	3.31	3.18	3.31	3.30	3.00	3.00	2.89	2.62
38 x 235 mm	4.23	4.23	4.05	4.23	4.20	3.82	3.83	3.68	3.34
45 x 95 mm	1.81	1.81	1.75	1.81	1.81	1.63	1.65	1.59	1.38
45 x 120 mm	2.28	2.28	2.20	2.28	2.28	2.08	2.08	2.00	1.81
45 x 145 mm	2.76	2.76	2.66	2.76	2.76	2.51	2.51	2.41	2.19
45 x 170 mm	3.23	3.23	3.11	3.23	3.23	2.93	2.94	2.83	2.56
45 x 195 mm	3.71	3.71	3.56	3.71	3.69	3.36	3.37	3.24	2.94
45 x 220 mm	4.19	4.19	4.01	4.19	4.16	3.78	3.79	3.65	3.31
72 x 120 mm	2.67	2.67	2.58	2.67	2.67	2.43	2.44	2.34	2.13
72 x 145 mm	3.23	3.23	3.10	3.23	3.22	2.93	2.94	2.82	2.57
72 x 170 mm	3.78	3.78	3.63	3.78	3.76	3.43	3.43	3.30	3.00
72 x 195 mm	4.34	4.34	4.15	4.34	4.30	3.92	3.93	3.78	3.44
72 x 220 mm	4.90	4.90	4.67	4.89	4.84	4.41	4.32	4.20	3.87
89 x 184 mm	4.39	4.39	4.19	4.39	4.34	3.97	3.97	3.83	3.48
89 x 235 mm	5.61	5.61	5.32	5.61	5.51	5.04	4.74	4.62	4.33

The above table provides a general summary of common permissible clear spans of simply supported domestic floor joists of solid timber for specified loadings, sizes and spacings. The table is solely for guidance on the loadbearing capacity of solid timber members, and cannot be adapted for hardwoods or engineered timber products. In preparing this table, Timber Development UK has assumed the complete design and build will be delivered by competent people and that thorough engineering calculations will be undertaken to verify the guidance provided above for each specific circumstance.

C24 Span Table
Domestic Floor Joists

Access for maintenance and repair only.
Imposed load not exceeding q_k = 1.5 kN/m² or Q_k = 2.0 kN or “slab loading”.

C24	Dead load G_k per square metre excluding weight of joist								
	G_k not more than 0.25 kN/m²			G_k not more than 0.5 kN/m²			G_k not more than 1.25 kN/m²		
	Centre-to-centre spacing of joists								
Joist size (breadth x depth)	400 mm	450 mm	600 mm	400 mm	450 mm	600 mm	400 mm	450 mm	600 mm
	Maximum clear span in metres								
38 x 89 mm	1.78	1.78	1.73	1.78	1.78	1.62	1.63	1.57	1.42
38 x 140 mm	2.80	2.80	2.70	2.80	2.80	2.55	2.55	2.46	2.23
38 x 184 mm	3.68	3.68	3.54	3.68	3.68	3.34	3.35	3.22	2.92
38 x 235 mm	4.70	4.70	4.51	4.70	4.68	4.26	4.22	4.10	3.73
45 x 95 mm	2.01	2.01	1.95	2.01	2.01	1.84	1.84	1.77	1.60
45 x 120 mm	2.54	2.54	2.46	2.54	2.54	2.31	2.32	2.23	2.02
45 x 145 mm	3.07	3.07	2.96	3.07	3.07	2.79	2.80	2.69	2.44
45 x 170 mm	3.60	3.60	3.47	3.60	3.59	3.27	3.28	3.15	2.86
45 x 195 mm	4.13	4.13	3.97	4.13	4.11	3.74	3.75	3.61	3.28
45 x 220 mm	4.66	4.66	4.47	4.66	4.63	4.22	4.19	4.06	3.69
72 x 120 mm	2.97	2.97	2.87	2.97	2.97	2.70	2.71	2.61	2.37
72 x 145 mm	3.59	3.59	3.45	3.59	3.58	3.26	3.27	3.14	2.86
72 x 170 mm	4.21	4.21	4.04	4.21	4.18	3.81	3.82	3.68	3.35
72 x 195 mm	4.83	4.83	4.61	4.83	4.78	4.36	4.27	4.16	3.83
72 x 220 mm	5.45	5.45	5.19	5.44	5.37	4.91	4.66	4.54	4.25
89 x 184 mm	4.89	4.89	4.66	4.89	4.82	4.41	4.29	4.18	3.88
89 x 235 mm	6.24	6.24	5.91	6.12	5.99	5.59	5.11	4.98	4.68

The above table provides a general summary of common permissible clear spans of flat roof joists of solid timber for specified loadings, sizes and spacings. The table is solely for guidance on the loadbearing capacity of solid timber members, and cannot be adapted for hardwoods or engineered timber products. In preparing this table, Timber Development UK has assumed the complete design and build will be delivered by competent people and that thorough engineering calculations will be undertaken to verify the guidance provided above for each specific circumstance.

C16 Span Table
Single Span Common or Jack Rafters

Roof slope between 30 and 45 degrees.
Imposed load not exceeding qk = 0.6 kN/m² or Q_k = 0.9 kN.

C16	Dead load G_k per square metre excluding weight of joist								
	G_k not more than 0.5 kN/m²			G_k not more than 0.75 kN/m²			G_k not more than 1.0 kN/m²		
	Centre-to-centre spacing of joists								
Joist size (breadth x depth)	400 mm	450 mm	600 mm	400 mm	450 mm	600 mm	400 mm	450 mm	600 mm
	Maximum clear span in metres								
38 x 89 mm	1.48	1.46	1.41	1.41	1.39	1.33	1.35	1.33	1.26
38 x 140 mm	2.68	2.63	2.51	2.51	2.45	2.32	2.37	2.32	2.18
38 x 184 mm	3.75	3.67	3.48	3.48	3.40	3.19	3.27	3.19	2.98
38 x 235 mm	5.01	4.90	4.61	4.61	4.49	4.20	4.32	4.20	3.91
45 x 95 mm	1.75	1.72	1.65	1.65	1.63	1.55	1.58	1.55	1.47
45 x 120 mm	2.36	2.33	2.22	2.22	2.18	2.06	2.11	2.06	1.95
45 x 145 mm	3.00	2.95	2.80	2.80	2.74	2.58	2.65	2.58	2.42
45 x 170 mm	3.65	3.57	3.39	3.39	3.31	3.11	3.19	3.11	2.91
45 x 195 mm	4.29	4.20	3.97	3.97	3.88	3.63	3.73	3.63	3.39
45 x 220 mm	4.94	4.83	4.56	4.56	4.44	4.16	4.28	4.16	3.87
72 x 120 mm	2.88	2.83	2.70	2.69	2.64	2.49	2.55	2.49	2.34
72 x 145 mm	3.62	3.55	3.37	3.37	3.29	3.10	3.18	3.10	2.90
72 x 170 mm	4.36	4.27	4.05	4.05	3.95	3.71	3.81	3.71	3.46
72 x 195 mm	5.11	5.00	4.71	4.72	4.61	4.32	4.44	4.32	4.02
72 x 220 mm	5.84	5.71	5.30	5.39	5.25	4.89	5.06	4.92	4.58
89 x 184 mm	5.15	5.04	4.75	4.77	4.65	4.37	4.48	4.37	4.07
89 x 235 mm	6.73	6.53	6.01	6.21	6.06	5.57	5.83	5.67	5.23

The above table provides a general summary of common permissible clear spans of single span common or jack rafters of solid timber for specified loadings, sizes and spacings. The table is solely for guidance on the loadbearing capacity of solid timber members, and cannot be adapted for hardwoods or engineered timber products. In preparing this table, Timber Development UK has assumed the complete design and build will be delivered by competent people and that thorough engineering calculations will be undertaken to verify the guidance provided above for each specific circumstance.

C24 Span Table
Single Span Common or Jack Rafters

Roof slope between 30 and 45 degrees.
Imposed load not exceeding q_k = 0.6 kN/m² or Q_k = 0.9 kN.

C24	Dead load G_k per square metre excluding weight of joist								
	G_k not more than 0.5 kN/m²			G_k not more than 0.75 kN/m²			G_k not more than 1.0 kN/m²		
	Centre-to-centre spacing of joists								
Joist size (breadth x depth)	400 mm	450 mm	600 mm	400 mm	450 mm	600 mm	400 mm	450 mm	600 mm
	Maximum clear span in metres								
38 x 89 mm	1.71	1.69	1.63	1.63	1.60	1.53	1.56	1.53	1.45
38 x 140 mm	3.07	3.01	2.86	2.86	2.80	2.64	2.70	2.64	2.47
38 x 184 mm	4.27	4.18	3.95	3.95	3.85	3.61	3.71	3.61	3.37
38 x 235 mm	5.67	5.51	5.04	5.21	5.08	4.66	4.88	4.74	4.37
45 x 95 mm	2.01	1.98	1.90	1.90	1.87	1.78	1.81	1.78	1.68
45 x 120 mm	2.71	2.67	2.54	2.54	2.49	2.35	2.41	2.35	2.21
45 x 145 mm	3.43	3.36	3.19	3.19	3.12	2.94	3.01	2.94	2.75
45 x 170 mm	4.15	4.06	3.84	3.84	3.75	3.52	3.61	3.52	3.29
45 x 195 mm	4.87	4.76	4.43	4.50	4.38	4.10	4.22	4.10	3.82
45 x 220 mm	5.59	5.45	4.98	5.15	5.01	4.61	4.82	4.69	4.33
72 x 120 mm	3.28	3.22	3.06	3.06	3.00	2.83	2.90	2.83	2.65
72 x 145 mm	4.11	4.03	3.82	3.82	3.73	3.50	3.60	3.50	3.28
72 x 170 mm	4.93	4.83	4.49	4.57	4.46	4.16	4.29	4.18	3.90
72 x 195 mm	5.75	5.59	5.13	5.31	5.18	4.76	4.99	4.85	4.48
72 x 220 mm	6.49	6.27	5.76	6.05	5.84	5.35	5.68	5.51	5.04
89 x 184 mm	5.79	5.63	5.17	5.36	5.23	4.80	5.04	4.90	4.52
89 x 235 mm	7.33	7.10	6.54	6.85	6.62	6.08	6.48	6.26	5.73

The above table provides a general summary of common permissible clear spans of simply supported domestic floor joists of solid timber for specified loadings, sizes and spacings. The table is solely for guidance on the loadbearing capacity of solid timber members, and cannot be adapted for hardwoods or engineered timber products. In preparing this table, Timber Development UK has assumed the complete design and build will be delivered by competent people and that thorough engineering calculations will be undertaken to verify the guidance provided above for each specific circumstance.

C16 Span Table
Single Span Common or Jack Rafters

Roof slope between 30 and 45 degrees.
Imposed load not exceeding q_k = 1.02 kN/m² or Q_k = 0.9 kN.

C16	Dead load G_k per square metre excluding weight of joist								
	G_k not more than 0.5 kN/m²			G_k not more than 0.75 kN/m²			G_k not more than 1.0 kN/m²		
	Centre-to-centre spacing of joists								
Joist size (breadth x depth)	400 mm	450 mm	600 mm	400 mm	450 mm	600 mm	400 mm	450 mm	600 mm
	Maximum clear span in metres								
38 x 89 mm	1.48	1.46	1.41	1.41	1.39	1.33	1.35	1.33	1.26
38 x 140 mm	2.68	2.63	2.51	2.51	2.45	2.32	2.37	2.32	2.18
38 x 184 mm	3.75	3.67	3.34	3.48	3.40	3.12	3.27	3.19	2.95
38 x 235 mm	4.85	4.67	4.25	4.54	4.37	3.98	4.30	4.14	3.76
45 x 95 mm	1.75	1.72	1.65	1.65	1.63	1.55	1.58	1.55	1.47
45 x 120 mm	2.36	2.33	2.22	2.22	2.18	2.06	2.11	2.06	1.95
45 x 145 mm	3.00	2.95	2.79	2.80	2.74	2.58	2.65	2.58	2.42
45 x 170 mm	3.65	3.57	3.27	3.39	3.31	3.05	3.19	3.11	2.89
45 x 195 mm	4.26	4.11	3.74	3.97	3.84	3.50	3.73	3.63	3.31
45 x 220 mm	4.79	4.62	4.21	4.49	4.33	3.94	4.26	4.10	3.73
72 x 120 mm	2.88	2.83	2.70	2.69	2.64	2.49	2.55	2.49	2.34
72 x 145 mm	3.62	3.55	3.25	3.37	3.29	3.05	3.18	3.10	2.88
72 x 170 mm	4.32	4.16	3.80	4.05	3.91	3.56	3.81	3.70	3.37
72 x 195 mm	4.93	4.76	4.35	4.63	4.47	4.08	4.40	4.24	3.86
72 x 220 mm	5.54	5.35	4.89	5.21	5.02	4.59	4.94	4.76	4.35
89 x 184 mm	4.97	4.80	4.39	4.68	4.51	4.12	4.44	4.28	3.90
89 x 235 mm	6.28	6.07	5.57	5.92	5.71	5.23	5.62	5.43	4.96

The above table provides a general summary of common permissible clear spans of single span common or jack rafters of solid timber for specified loadings, sizes and spacings. The table is solely for guidance on the loadbearing capacity of solid timber members, and cannot be adapted for hardwoods or engineered timber products. In preparing this table, Timber Development UK has assumed the complete design and build will be delivered by competent people and that thorough engineering calculations will be undertaken to verify the guidance provided above for each specific circumstance.

C24 Span Table
Single Span Common or Jack Rafters

Roof slope between 30 and 45 degrees.
Imposed load not exceeding q_k = 1.02 kN/m² or Q_k = 0.9 kN.

C24	Dead load G_k per square metre excluding weight of joist								
	G_k not more than 0.5 kN/m²			G_k not more than 0.75 kN/m²			G_k not more than 1.0 kN/m²		
	Centre-to-centre spacing of joists								
Joist size (breadth x depth)	400 mm	450 mm	600 mm	400 mm	450 mm	600 mm	400 mm	450 mm	600 mm
	Maximum clear span in metres								
38 x 89 mm	1.71	1.69	1.63	1.63	1.60	1.53	1.56	1.53	1.45
38 x 140 mm	3.07	3.01	2.76	2.86	2.80	2.60	2.70	2.64	2.46
38 x 184 mm	4.13	3.98	3.62	3.89	3.74	3.40	3.69	3.55	3.23
38 x 235 mm	5.25	5.06	4.61	4.94	4.76	4.33	4.70	4.52	4.11
45 x 95 mm	2.01	1.98	1.90	1.90	1.87	1.78	1.81	1.78	1.68
45 x 120 mm	2.71	2.67	2.51	2.54	2.49	2.35	2.41	2.35	2.21
45 x 145 mm	3.43	3.32	3.03	3.19	3.12	2.84	3.01	2.94	2.70
45 x 170 mm	4.03	3.89	3.54	3.80	3.66	3.33	3.61	3.47	3.16
45 x 195 mm	4.61	4.45	4.05	4.35	4.18	3.81	4.13	3.97	3.62
45 x 220 mm	5.19	5.00	4.56	4.89	4.71	4.29	4.65	4.47	4.07
72 x 120 mm	3.28	3.21	2.93	3.06	3.00	2.75	2.90	2.83	2.61
72 x 145 mm	4.00	3.86	3.52	3.78	3.64	3.32	3.59	3.46	3.15
72 x 170 mm	4.67	4.51	4.12	4.41	4.25	3.88	4.20	4.04	3.68
72 x 195 mm	5.34	5.15	4.71	5.04	4.86	4.44	4.80	4.62	4.22
72 x 220 mm	5.99	5.78	5.30	5.66	5.46	4.99	5.39	5.20	4.75
89 x 184 mm	5.38	5.19	4.75	5.08	4.90	4.48	4.84	4.67	4.26
89 x 235 mm	6.79	6.56	6.02	6.43	6.21	5.69	6.13	5.92	5.41

The above table provides a general summary of common permissible clear spans of single span common or jack rafters of solid timber for specified loadings, sizes and spacings. The table is solely for guidance on the loadbearing capacity of solid timber members, and cannot be adapted for hardwoods or engineered timber products. In preparing this table, Timber Development UK has assumed the complete design and build will be delivered by competent people and that thorough engineering calculations will be undertaken to verify the guidance provided above for each specific circumstance.

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