



C16 Strength Graded Construction Timber Span Tables



British Timber

The UK softwood market is utilising more and more "homegrown" material due to the benefits of its quality, certification, availability and lower carbon miles. 70% of this market consists of construction materials which are commonly used in timber frame, stud walls, roofs, and floor joists.

Wood is the only truly sustainable material on this planet: we can grow as much timber as we need, in well-managed forests. Using timber in construction is a great way to lock away Carbon for long periods. It has been calculated that a typical 3-bedroom semi-detached Timber Frame House, using about 6m³ of timber and wood-based products, stores about 1.2 tonnes of Carbon (equivalent to over 4 tonnes of atmospheric CO₂). And even when wood is eventually recycled, it releases its Carbon back into the atmosphere within a relatively short time (compared to the millennia-long sequestration, and then eventual new release of Carbon from fossil sources, such as coal and oil). So timber, being relatively newly-grown and then returned directly to nature, is in effect "Carbon Neutral".

In addition, using British timber dramatically reduces the miles to market therefore reducing environmental impact further.

C16 Most Commonly Used Construction Timber

Softwoods are the most frequently-used timbers for loadbearing situations. In order to comply with the Building Regulations they must always be strength graded: they are then usually put into a Strength Class. In the UK, softwoods are graded visually, in accordance with BS 4978:2007, or by machine to EN 14081:2005.

BSW Timber grade all load bearing construction timbers by a machine to achieve C16 strength Class and the timber is stamped accordingly. BSW use BM TRADA as the independent body who audit and check the strength grading machine to ensure that all C16 strength graded timber complies with current legislation and guidelines.

Preservative Treatment

BSW have both high and low pressure preservative treatment facilities to service the demands of the construction market and to increase the durability of timber.

Low pressure treatment is a water-based preservative treatment for use in constructional applications.

The benefits are

- Effective, long term protection against decay and insect attack.

- Designed for use in internal and external building applications above dpc level - Use Classes 1-3.1.
- Distinctive golden yellow shade makes identification easier.
- Ideal for strength graded material in accordance with BS 4978.
- Approved by the National House Building Council and major house builders.
- Ideal for timber frame and repair, maintenance and improvement projects.

High pressure treatment is a copper-based preservative treatment for use in constructional and in-ground applications.

The benefits are

- Established and proven.
- Effective long-term protection against fungal and insect attack.
- Available in natural green or brown colour.
- Ideal for general construction, fencing, garden and leisure timber applications.

Joist Spans in Construction

Joist spans refer to the "clear" distance that the joist carries over, rather than the overall length of the piece of timber. However as well as the distance to be "bridged", both ends of the joist must be properly supported: therefore a clear span of 3metres will actually require a timber member in the order of 3.3 metres. This will have 100-150mm of timber at each end, resting on some form of support: for example a wall made of brick, block, timber stud frame, or a joist hanger. The table opposite details the joist span requirements for given sections of timber. A structural engineer should be consulted for the design of timber structures.

British C16 - Less Miles to Market

C24 timbers travel to us from Europe: from the forest to the sawmill; from the sawmill to the docks; then by ship to a UK port; and finally a journey by truck. Whereas the use of British



Grown C16 timber usually means fewer miles, by truck only.



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PERMISSIBLE CLEAR SPANS (MM) FOR DOMESTIC FLOOR JOISTS FOR TIMBER MACHINED ON ALL FOUR SIDES IN ACCORDANCE WITH BS EN 336.

IMPOSED LOAD NOT EXCEEDING 1.50KN/M²

STRENGTH CLASS C16. SERVICE CLASS 1 OR 2.

	Dead load kN/m ² excluding self weight of joist											
	Spans Primarily for Ground Floors				Spans for first floor / intermediate floors of Buildings				Spans for apartments and flats to enhance acoustic benefits as they need to be deeper joist for sound prevention			
	Less than 0.25kN/m ²				0.25 - 0.5kN/m ²				0.75 - 1.25kN/m ²			
c/c joist joist ref.	400	450	480	600	400	450	480	600	400	450	480	600
45 x 95mm	1930	1824	1766	1473	1833	1734	1650	1363	1572	1439	1371	1152
45 x 120mm	2593	2492	2438	2183	2479	2382	2312	1974	2153	1983	1894	1609
45 x 145mm	3127	3006	2941	2705	2990	2873	2811	2531	2643	2493	2414	2079
45 x 170mm	3659	3518	3443	3138	3500	3364	3279	2937	3066	2892	2801	2505
45 x 195mm	4189	4029	3943	3565	4007	3845	3726	3338	3484	3287	3184	2848
45 x 220mm	4698	4537	4441	3988	4514	4300	4167	3734	3898	3678	3563	3188
72 x 120mm	3031	2915	2854	2650	2900	2789	2731	2534	2609	2508	2454	2252
72 x 145mm	3651	3513	3440	3196	3495	3363	3292	3057	3147	3026	2960	2731
72 x 170mm	4267	4108	4023	3739	4087	3933	3852	3577	3682	3541	3465	3167
72 x 195mm	4822	4700	4603	4280	4676	4501	4407	4096	4215	4055	3968	3599
72 x 220mm	5265	5119	5041	4775	5100	4957	4880	4612	4721	4566	4487	4025

NOTE - The above spans are based on a deflection criterion of 0.003 times span, or 14mm, whichever is the lesser. This deflection criterion assumes that strutting is present for spans greater than 2500mm. This strutting may comprise either timber herringbone strutting (of minimum cross-section 38mm x 38mm) or solid timber blocking (of minimum thickness 38mm and minimum depth of 0.75 times the joist depth).

Source: Timbersolve April 2010