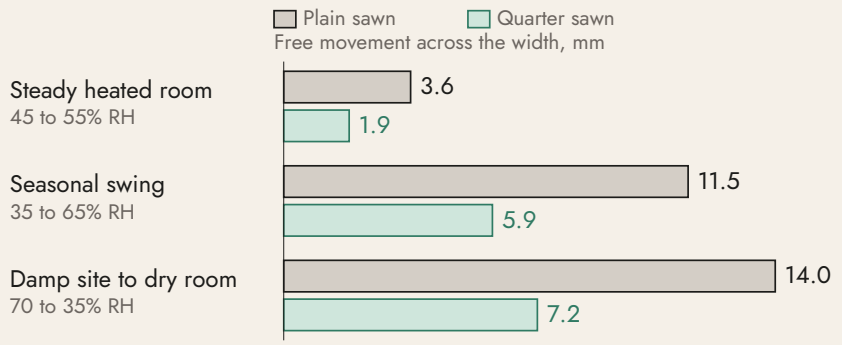
Timber *movement* in panelling and veneered walls

Why solid and veneered panelling cracks or opens at joints, how far timber moves with humidity (our arithmetic from the Wood Handbook), the moisture content to fit at, and how to detail and specify so it can move.

AT A GLANCE

Question	What the sources we read say	Source	What to specify
Why it moves	Wood swells in high humidity and shrinks in low. Most problems come from faulty design or the wrong humidity during storage, fitting or use.	AWS Section 2, 1.2.5	Design for movement. Hold the room conditions.
How much	Size x coefficient x change in moisture content, between 6% and 14%. White oak, per point: 0.00376 across a plain sawn width, 0.00194 across a quarter sawn width.	WH Eq. 13-3, Table 13-5	Work it out for the widest piece.
Moisture content at fitting	Interior woodwork, US: average 8% (pieces 6 to 10%); dry south-west 6%; damp coast 11%. Hold 25 to 55% RH for most of the US and Canada. No UK table was read.	WH Table 13-2; AWS Fig. 2-1	Name a figure, a range and an RH band. Record readings.
Board products	MDF, particleboard and hardboard settle lower than lumber. Condition at 30 to 40% RH for interior use.	WH ch. 13, p. 13-5	Ask the partner how boards are conditioned.
Solid panelling	Install large solid pieces free to move across the grain. Narrow widths are preferable.	WH ch. 13, p. 13-18	Floating panels. No rigid fixing across the width.
Veneered board	Balanced: same thickness and species either side of the core. Finish both faces.	AWS Section 4, 1.2.1; Section 5, 1.2.5	Balancer on the reverse. Finish every face.
Before delivery	Area enclosed, wet work dry, overhead work done, broom clean. Do not flush off-gases with sustained heat.	AWS Section 2, 4.1.1, 1.5.1	Gate the delivery on the conditions.
Who answers for it	Design: the design professional. Humidity in storage and fitting: the contractor. Extremes after occupancy: the owner.	AWS Section 2, 1.4.1	Put the three lines in the specification.

AWS is the Architectural Woodwork Standards, 1st edition (2009, US). WH is the US Forest Products Laboratory Wood Handbook (FPL-GTR-282, 2021). Both are US documents: no UK moisture table was read. Movement figures are our arithmetic from the Wood Handbook. The partner workshop's own limits take precedence.



Free movement across the width of a 600 mm wide solid white oak panel, three humidity cases (Wood Handbook Tables 4-2 and 13-5, Equation 13-3). Our arithmetic, not a measurement. Original chart by Make Bespoke Studio.

SPECIFICATION WORDING

MOISTURE CONTENT AT FITTING

Timber and wood-based panelling to be at a moisture content of [x]% (individual pieces [y to z]%) on delivery and at fixing, measured with a calibrated meter set for the species or board, on not fewer than [10]% of each item. Readings, meter and date to be recorded and issued to [designer] before fixing.

SITE CONDITIONS BEFORE DELIVERY

Panelling is not to be delivered until the building is enclosed, wet trades are complete and dry, overhead work is complete and the area is broom clean, and heating and ventilation have held [30 to 55]% relative humidity at [ ] degrees C for [ ] days, as shown by a logger record issued to [designer]. Conditions are to be held during fixing. The temperature is not to be raised for a sustained period to drive off off-gases.

SOLID PANELS AND MOVEMENT

Solid timber panels over [300] mm wide are to float in the frame. Clearance in each groove not less than [ ] mm, worked from [species and cut] and a [ ] to [ ]% RH range, and shown on the shop drawing. No glue or rigid fixing in the groove or across the width of the panel. Fixed point of each panel at [centre].

VENEERED BOARD

Veneered panels to be balanced: [veneer of the same species and thickness / a balancer of similar behaviour] on the reverse, all faces and edges finished with the same system, on [board] conditioned to the site relative humidity before fixing. Backing and blocking supplied by [ ]. Back of panels [sealed / back-primed]. Joints between panels [as a [ ] mm shadow gap].

TERMS USED

Moisture content

The water in a piece of timber as a percentage of its oven-dry weight. Timber is fitted close to the moisture content it will reach in the room.

Equilibrium moisture content (EMC)

The moisture content at which wood neither gains nor loses moisture in air at a given relative humidity and temperature.

Tangential and radial

Two directions across the grain. Tangential runs along the growth rings and moves most; radial runs across them and moves about half as much. Movement along the grain is very small.

Floating panel

A panel held loose in a groove in its frame, with clearance, so that it can swell and shrink without splitting or pushing the frame apart.

Balanced construction

A panel built so that changes in moisture content will not cause it to warp: matching thickness and species either side of the core, and finish on every face.

STANDARDS AND SOURCES

- USDA Forest Products Laboratory, Wood Handbook, FPL-GTR-282 (2021): Ch. 4 Tables 4-2, 4-3; Ch. 13; Ch. 19 p. 19-14. Read 5 Nov 2026.
- Architectural Woodwork Standards, 1st edition (2009): Sections 2, 4, 5 and 8. US standard. Read 5 Nov 2026.
- BS EN 942:2007, Timber in joinery: general requirements: Named, not read: confirm moisture content figures against the current edition.
- NHBC Standards, chapter 6.7.7, Timber doors and windows: Named, not read (the page refused the request): confirm.

Full guide: https://makebespoke.com/trade/technical/timber-movement-in-panelling-and-veneer. Make Bespoke Studio coordinates manufacture through its partner workshops. Figures are guidance only and your specification governs; some may be superseded, so contact the studio to verify.