

FACT FILE 3: Movement

Movement

Steel frames are often associated with myths regarding major movement due to expansion and contraction resulting in either cracked plasterboard or noisy frames.

The noisy frames myth is a beauty: its wide currency and persistence is only matched by a complete absence of evidence in its support. How and where it started is a mystery. Anyone stating that steel frames are noisy should be challenged and asked for proof in the form of hard evidence - facts and figures, not just hearsay or reference to a single isolated instance.

The fact of the matter is that steel frames are not noisy and solid evidence exists to support this view.

G. A. King, Dr. M. Ridge and G. S. Walker of the CSIRO conducted a properly structured study in which they surveyed a number of occupants of steel-framed dwellings. They published the results in *Building Materials and Equipment, Vol. 17, No. 1*. They found that "most occupants either reported no sound emitted from the frame, or if they did, said that it constituted no problem".

Their findings were in accordance with another study (by Brealey) in which numerous people, living in remote tropical settlements were asked, among other things, their reactions to their houses.

"Many of these had steel frames, and no one complained of annoying noises. In considering the occurrence of thermal noises in steel framed houses it should be borne in mind that considerable noise may be provided in the timber parts of conventional dwellings. In fact four of the subjects volunteered the information that there was less noise in their present homes than in timber or brick veneer houses they had occupied previously."

Whether a steel frame is mechanically jointed or welded, movement caused by changes in temperature is not an issue in a properly constructed and insulated home.

From a technical viewpoint it is unlikely that steel framing would generate significant thermally-induced sounds. The steel framing is not directly exposed to radiation from the sun. Therefore the frame itself and any internal linings will not be influenced by the sun's rays. Similarly, the frame will not be directly exposed to the heat from internal heating.

Steel framing expands and contracts at rates reasonably similar to those of other building materials, which means it is unlikely there will be either noise or cornice cracking problems. For example, it is a fact that the coefficient of linear expansion of gypsum plasterboard is nearer to that of steel than that of timber. Furthermore, as the figures in the table below indicate (assuming that relative movement between materials is indeed a factor) when the temperature changes, commonly used external and internal materials will move more relative to timber than to steel.

Coefficients Of Linear Expansion, mm/mm/degree C

Steel	11.7 x 10 ⁶
Fibre cement or similar	Approx. 7.5 x 10 ⁶
Gypsum plasterboard	Approx. 16.5 x 10 ⁶
Wood	Approx. 4.5 x 10 ⁶

It is interesting to note that one supplier of steel-framed kit homes makes a point of following up on its customers for feedback on the performance of their new homes. This company has supplied hundreds of homes to owners. To date not one person has complained about a noisy frame.

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