Frame data The AFRC Frame Index November 2026 756 sections

756 window sections: what Australian window frames actually achieve.

AFRC Lab has modelled **756 window and facade frame sections** used in Australia, from standard aluminium through to thermally broken frames. The typical window frame U-value is about **6.5 W/m²K**. That is about **2.4 times** the reference double glazing modelled with it (2.7 W/m²K), and around **five times** a modern low-e unit. Only **4 %** of sections came in under 4 W/m²K, while **27 %** were above 8.



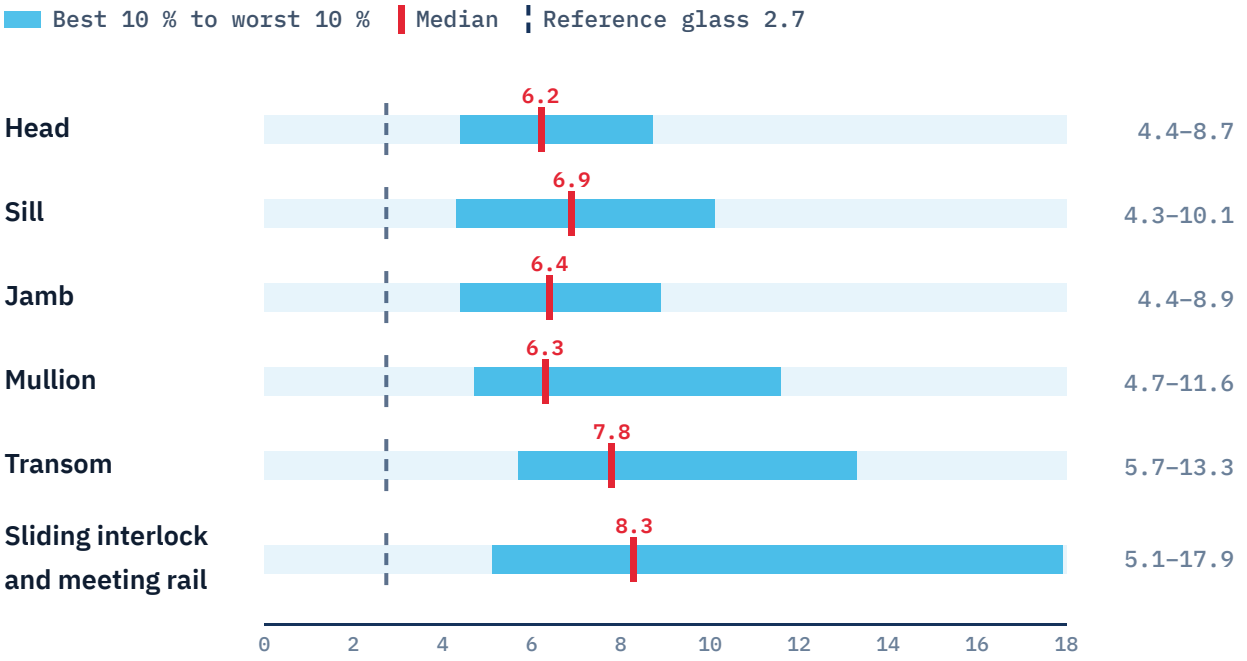
By **Dave Morehouse**, founder, AFRC Lab · updated monthly

756	6.5	2.4×	89 %
frame sections modelled	median frame U-value, W/m²K	the reference glass (2.7 W/m²K)	of frames with fRsi below 0.5

The coldest point on the room side of the frame tells the same story. On a cold design night, the typical frame's coldest spot sits about a third of the way from the outdoor to the indoor temperature (fRsi 0.33), and **89 % of sections fall below 0.5**. In practice, the frame, not the glass, is where condensation and mould on window frames start.

Window frame U-values by member

Heads, jambs and mullions sit close together at around 6.2–6.4 W/m²K, with sills a little higher at 6.9. Transoms and sliding interlocks are the weakest members, with a long tail of very poor sections.



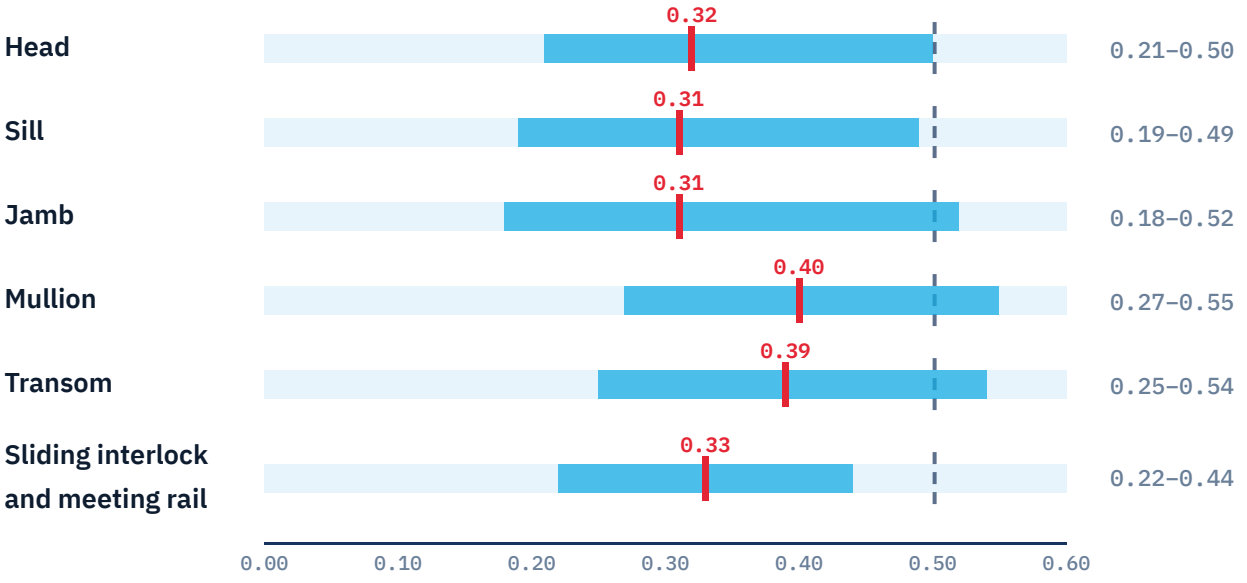
Frame U-value (W/m²K), lower is better. Bar runs from the best 10 % to the worst 10 % of sections; the mark is the median.

MEMBER	SECTIONS	BEST 10 % (W/M²K)	MEDIAN (W/M²K)	WORST 10 % (W/M²K)	MEDIAN FRAME WIDTH (MM)
Head	198	4.4 or better	6.2	8.7 or worse	123
Sill	190	4.3 or better	6.9	10.1 or worse	97
Jamb	189	4.4 or better	6.4	8.9 or worse	110
Mullion	75	4.7 or better	6.3	11.6 or worse	132
Transom	57	5.7 or better	7.8	13.3 or worse	110
Sliding interlock and meeting rail	47	5.1 or better	8.3	17.9 or worse	69

Within each member, the worst sections lose about twice as much heat through the frame as the best, for the same job. That spread is the whole story behind thermally broken window frames: the label alone doesn't put a frame in the best 10 %.

Condensation on window frames: fRsi by member

The temperature factor fRsi shows how warm the coldest point on the room-side frame stays. A value of 0 means as cold as outside, and 1 means as warm as the room. Most frames sit around a third of the way.



Frame fRsi (0 = outdoor temperature, 1 = room temperature), higher is better.

MEMBER	LOWEST 10 %	MEDIAN	HIGHEST 10 %
Head	0.21	0.32	0.50
Sill	0.19	0.31	0.49
Jamb	0.18	0.31	0.52
Mullion	0.27	0.40	0.55
Transom	0.25	0.39	0.54
Sliding interlock and meeting rail	0.22	0.33	0.44

As a guide, in a room at 20 °C and 50 % RH, mould can start to grow on a surface colder than about 12.6 °C. With 5 °C outside, a frame at fRsi 0.33 has a coldest point near 10 °C, inside that risk band. Whether it actually goes mouldy depends on the climate, the room and how long the surface stays that cold. Our window-to-wall mould study answers that question, scored on the AIRAH DA07 Mould Index used by the NCC's Part F8 condensation provisions. For mould on window frames in a real home, see where windows really grow mould.

Why the frame matters for window U-value and thermal bridging

- **Designers and ESD consultants:** a whole-window U-value can hide a frame doing most of the damage. Ask for frame U-values and fRsi by member, not just the whole-window number. For Section J glazing, the frame is part of the answer.

- **Builders:** mould and condensation call-backs start at the frame and its junction with the wall. The gap detail can be fixed on site, but a cold frame has to be designed out at procurement.
- **Certifiers:** NCC condensation provisions are about surfaces, and the frame is usually the coldest surface in the room. It is also the thermal bridge the code doesn't count.
- **Window makers:** the spread within each member shows how much improvement is available. The best 10 % are not exotic products; they are the same members done better.

Method and basis

- 756 window and facade sections modelled by AFRC Lab, using the latest passing run per section after automatic quality checks. The latest batch ran October–November 2026.
- Every one of the 756 sections is in the tables, grouped by the job the member does (for example, meeting rails are counted with sliding interlocks).
- 2-D conduction to ISO 15099 with NFRC 100 boundary conditions (winter: −18 °C outside, 21 °C inside), and cavities to ISO 15099.
- Solved with the AFRC Lab CFL solver, which is checked against LBNL THERM 7.8 and validated against the EN ISO 10077-2 reference cases (see the verification record).
- Frame U-value is per projected frame area. fRsi is the minimum room-side frame surface temperature factor.
- All sections use a common reference double-glazed unit (about 2.7 W/m²K centre-of-glass), so frame figures compare like with like across systems.
- For frame U-values compared by material (uPVC, timber, thermally broken aluminium, curtain wall, steel), see the window frame U-value benchmark.
- Results are grouped by member type only. No supplier, system or project is named, and no single section's values are shown.
- Frame types range from standard aluminium to thermally broken, and include other systems for residential and commercial work. The set reflects what was sent to AFRC Lab for modelling; it is not a market survey.

Frequently asked questions

What is a typical U-value for an Australian window frame?

Across 756 sections modelled by AFRC Lab, the median frame U-value is about 6.5 W/m²K. The best 10 % come in around 4.3–5.7 W/m²K depending on the member, and the worst exceed 8.7–17.9 W/m²K.

Why do window frames get condensation before the glass?

The frame is usually the coldest surface. 89 % of the sections we modelled have a frame fRsi below 0.5, so their coldest point sits closer to the outdoor temperature than the indoor one.

Which part of a window performs worst?

Sliding interlocks and meeting rails (median 8.3 W/m²K) and transoms (median 7.8 W/m²K) are the weakest members, followed by sills.

What is fRsi?

The temperature factor of the coldest internal surface: (surface temperature – outside) ÷ (inside – outside). Higher is warmer and safer from condensation and mould.

How does AFRC Lab calculate these values?

2-D thermal simulation to ISO 15099 / NFRC 100 using AFRC Lab's CFL solver, which is checked against LBNL THERM and validated against the EN ISO 10077-2 reference cases.

The AFRC Frame Index is aggregated and de-branded. Figures are distributions across the sections AFRC Lab has modelled, grouped by member type, at a common reference glazing. They describe frames, not finished windows or installations, and are refreshed monthly. Final NCC compliance is determined by your assessor or certifier.