Thermal Break Windows

What the break does. And what it doesn't.

WHAT A THERMAL BREAK WINDOW DOES

A thermal break aluminium window splits the frame extrusion into two leaves — outer (cold side) and inner (warm side) — joined by a low-conductivity insert, typically **polyamide nylon (~0.3 W/m·K)** or **polyurethane foam (~0.03–0.05 W/m·K)**. The insert can be any material that conducts significantly less than aluminium's 160 W/m·K. The direct metal path is blocked. Frame conductance drops 15 to 20 times. The inner surface warms up. The whole-window U-value improves.

~160
W/m·K
Standard aluminium frame conductance

6–10
W/m·K
Thermally broken frame conductance

0.4–0.8
W/m²K
Typical Uw improvement (DGU)

THE HEAT PATH SHIFT

In a standard frame, the path of least resistance (Path 1) runs straight through the continuous aluminium profile — a direct thermal bridge carrying ~74% of frame heat. In a thermally broken frame, that metal path is interrupted. Path 1 shifts: the primary route becomes the **warm-edge spacer at the IGU edge**. The frame is no longer the dominant path. That is what the break actually achieves.

STANDARD vs THERMAL BREAK ALUMINIUM

STANDARD ALUMINIUM	THERMAL BREAK ALUMINIUM
One-piece extrusion — aluminium all the way through	Two leaves joined by low-conductivity insert
Frame conductance ~100–160 W/m·K	Frame conductance ~6–10 W/m·K
Inner surface cold enough to condense in mild winters	***Inner surface warmer — condensation risk reduced***
Uw (whole window) limited by frame heat loss	***Uw typically 0.4–0.8 W/m²K better (DGU)***
Path 1 runs straight through the frame metal	***Path 1 shifts to the IGU warm-edge spacer — frame no longer dominant***
Mould Index (AIRAH DA07): 5.9–6.0 in zones 5–6	Mould Index: 4.3–5.9 in zones 5–6 — improved but still fails MI 3 pass mark

THE CATCH — why thermally broken windows still fail mould compliance

NCC 2022 requires a ventilated cavity behind cladding. In winter that cavity moves cold outside air around the outer leaf all day. The break slows conduction through the frame profile. It has no effect on convective heat loss from the outer leaf to the cavity airstream. The rated Uf is measured in still air. The installed performance is what a junction analysis finds.

Full data, methodology and pass/fail results for 40 installations: afrclab.com.au/insight-thermally-broken-windows

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