

CNCGLASS

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TECHNICAL NOTE

Fixing Edge Bubbles in Thin Silk Fabric EVA Laminated Glass

By Peter Lin · CNC Ucolin Interlayer Technology Co., Ltd.

CNCGLASS · 1. The problem — edge bubbles on thin silk laminates

When laminating glass with thin, lightweight silk fabric in an EVA interlayer stack, edge bubbles are a common failure mode. In one client production line, every piece showed bubbles along the perimeter, and the squeeze-out glue looked foamy and bubbly. Fine silk, lightweight cloth, loose weaves, and natural fibers have low structural stability. Moisture uptake and in-oven shrinkage can open voids at the edge while melt flow pushes the fabric. Treat these inserts as process-sensitive — not as decorative paper that “just goes in.”

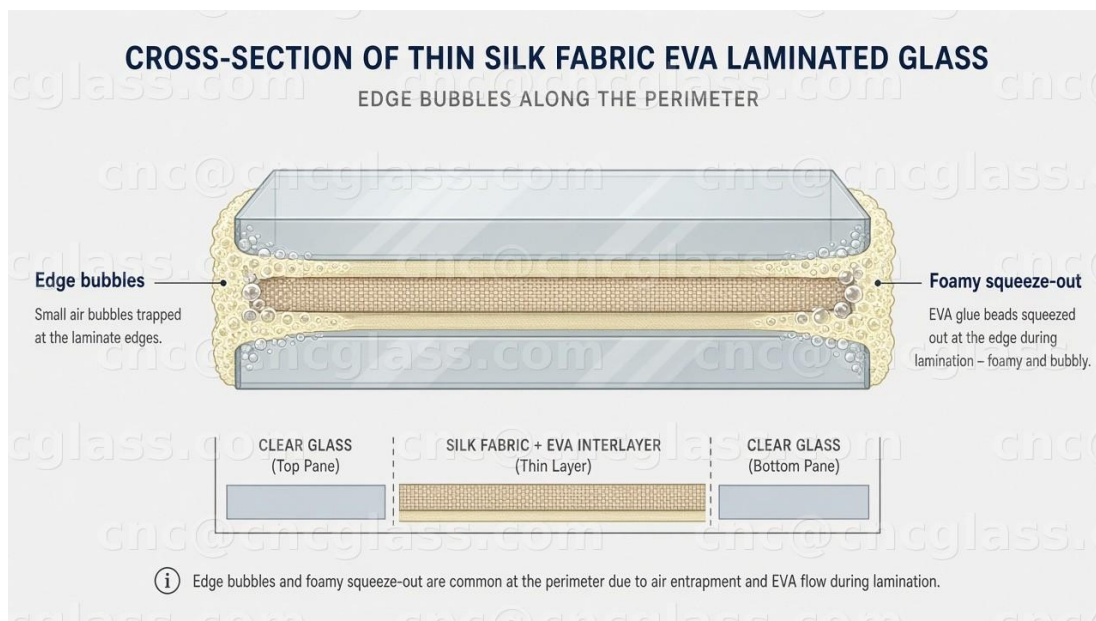


Figure 1 — Problem: edge bubbles and foamy squeeze-out on thin silk fabric EVA laminates.

CNCGLASS · 2. Round 1 — copy the client cycle (lab confirmation)

The lab reproduced the client recipe exactly: hold at **60 °C for 20 minutes**, then **125 °C for 60 minutes**. The same edge bubbles appeared in the lab furnace.

That ruled out “only their furnace is wrong.” The defect was reproducible on the same cycle, so the next step was to change parameters rather than blame one machine.

CNCGLASS · 3. Round 2 — slower and cooler ramp

Temperatures were lowered and the ramp slowed:

- **60 °C for 20 minutes** (same first hold)
- **80 °C for 20 minutes** (added intermediate hold)
- **105 °C for 60 minutes** (lower peak vs. source 125 °C)

- Ramp rate **4 °C/min**

Lab samples then came out with clean edges and no bubbles. The client ran the updated cycle: bubbles improved but were not fully gone.

Same recipe, different machines: heating speed, sensor placement, control tuning, and chamber layout all change the glass and interlayer temperature history. A cycle that is clean in one oven must still be validated on the production furnace — do not assume 1:1 transfer.

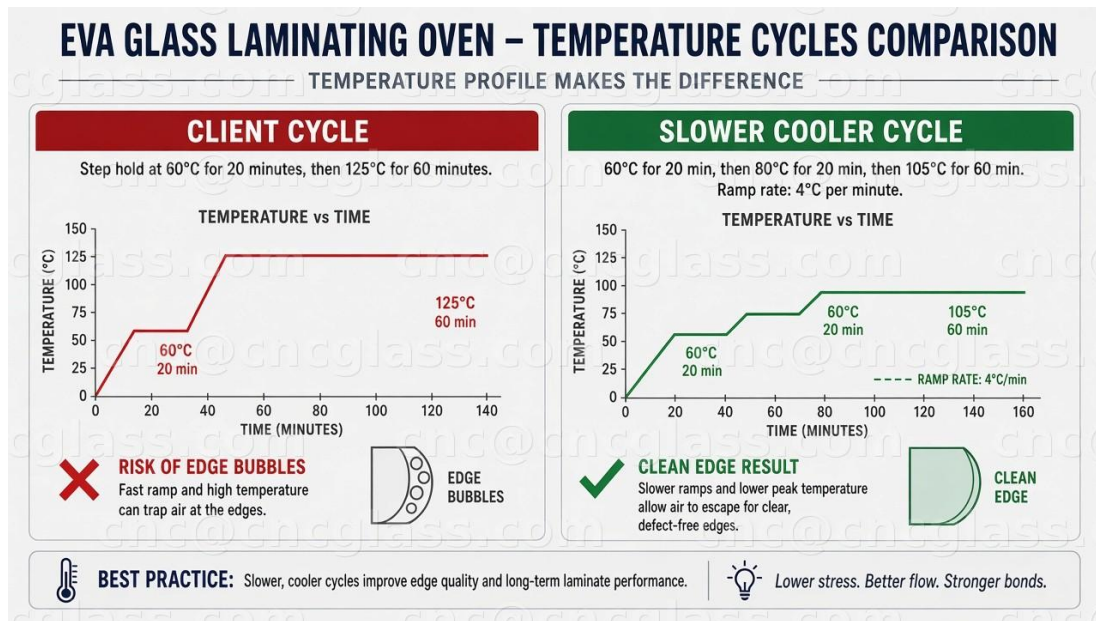


Figure 2 — Oven cycles: client 60 °C/20 + 125 °C/60 vs slower cooler ramp (4 °C/min).

CNCGLASS · 4. Round 3 — fabric prep + low-flow EVA

Fabric testing showed shrinkage of about **3–4 %** and moisture content that was too high for a stable lay-up. Before laminating, the silk was **pre-dried and pre-shrunk** so most dimensional change and moisture left the fabric outside the oven.

In parallel, the interlayer was switched to a **low-flow EVA film (EVAFORCE EXTREME)** so molten adhesive would push and deform the fabric less during heat and vacuum.

With pre-dry / pre-shrink plus low-flow EVA (and the moderated cycle as needed), the client's factory run produced edges with bubbles completely gone.



Figure 3 — Fabric prep: pre-dry and pre-shrink silk (shrinkage often 3–4 %; high moisture).

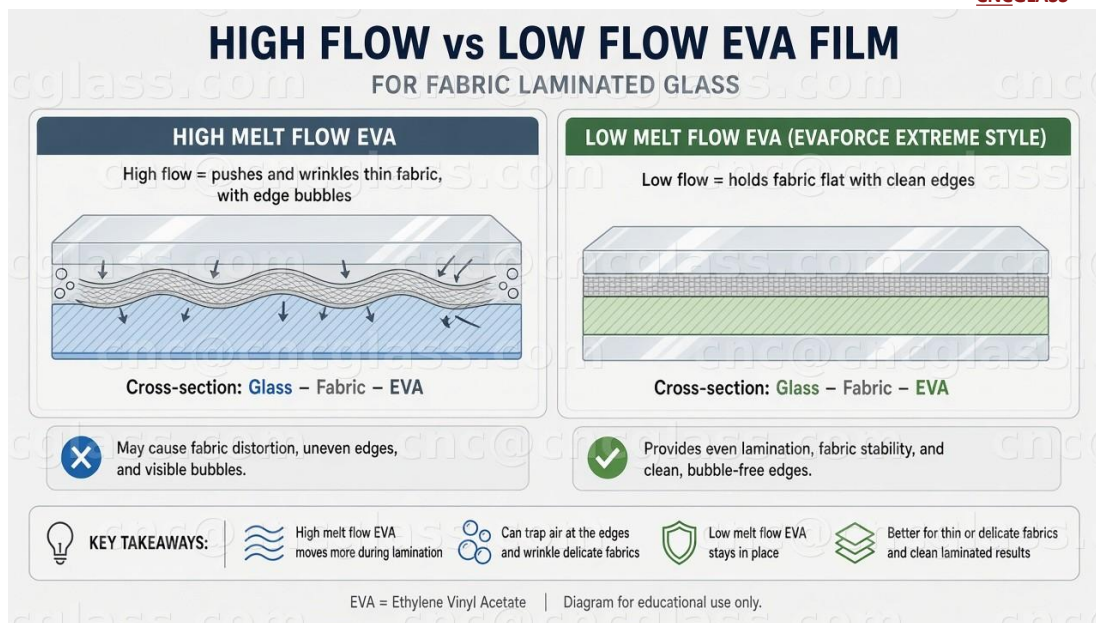


Figure 4 — Interlayer choice: low-flow EVA (e.g. EVAFORCE EXTREME) reduces fabric push.

CNCGLASS · 5. Practical checklist for fine silk / lightweight / loose weave / natural fiber

These materials need extra discipline before and during lamination:

- Store fabric in a controlled temperature and humidity room so it does not pick up extra moisture before lay-up.
- Pre-dry and pre-shrink the fabric so most shrinkage and moisture loss happen before the oven cycle.
- Control furnace ramp rate — avoid temperature overshoot and keep heating even across the glass load.
- Use a low-flow EVA film (such as EVAFORCE EXTREME) to limit melt push that wrinkles or lifts delicate fabric at the edge.
- Validate the final cycle on the production machine; lab success does not automatically transfer to a different furnace.



Figure 5 — Application: silk-fabric EVA laminated glass as an interior partition.

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