

CNCGLASS

Brand: **CNCGLASS**

Company: **CNC Ucolin Interlayer Technology Co., Ltd.**

Address: SHENZHEN, GD, CHINA

Peter Lin | cnc@cncGlass.com | WhatsApp/Mobile +86 15013829504 | WeChat wecan365 | www.cncglass.com

TECHNICAL NOTE

Low Viscosity of Glass Laminating EVA Interlayer Film

《低粘度玻璃夹层 EVA 中间膜》

By Peter Lin

CNCGLASS · 1. What Viscosity Means in Glass Lamination

In glass lamination, interlayer viscosity describes how readily the polymer flows when heated during bonding. Melt viscosity (and melt flow) governs whether the interlayer can wet bonding faces, fill local gaps, and displace trapped air before the laminate cools and cross-links or solidifies.

For workshops laminating tempered glass or hybrid stacks, that flow behavior is as practical as adhesion chemistry: an interlayer that stays too stiff under process heat may bridge over roller-wave valleys or insert edges and leave voids; an interlayer that becomes more fluid can couple more of the available surface.

CNCGLASS · 2. EVA vs PVB — Melt Flow Behavior

The melt viscosity of EVA (ethylene-vinyl acetate) interlayer film is lower than that of PVB (polyvinyl butyral) interlayer film under typical laminating heat.

Public technical literature on architectural EVA describes a distinct melting transition (often cited near ~70–75 °C for VA contents around 26–28%) followed by a relatively high melt-flow state, whereas PVB softens toward a more rubbery response without the same sharp crossover to a low-viscosity melt. In qualitative terms: molten EVA tends to behave more “liquid-like” during vacuum-oven bonding; PVB remains more viscous and flow-limited at process temperature. Exact MFI / melt-viscosity numbers depend on grade, plasticizer system, cross-linking package, and test method — this note does not invent catalog figures.

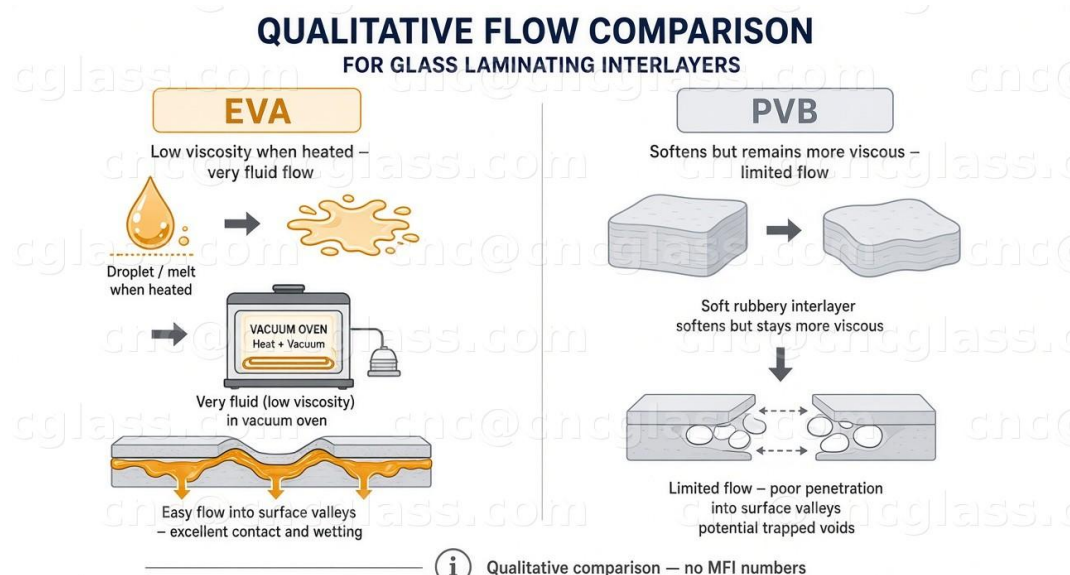


Figure 3 — Qualitative flow comparison: molten EVA (high melt flow) vs. PVB (softens to a more rubbery state). No melt-flow numbers shown.

CNCGLASS · 3. Why Uneven Surfaces Benefit from Low-Viscosity EVA

Because of this lower melt viscosity, EVA film is well suited for laminating sheets with uneven bonding faces — for example tempered (toughened) glass with roller-wave / overall-bow distortion, and polymer sheet materials such as PVC, PET, polycarbonate (PC), and acrylic (PMMA).

Horizontally tempered glass commonly carries roller-wave and overall bow within EN 12150-type flatness tolerances. When two such panes are paired, local gaps can open between the faces. A low-viscosity melt helps fill those gaps; industry handling notes for EVA similarly recommend adequate interlayer thickness (or multiple plies) when laminating thick or uneven tempered glass. Polymer inserts and hybrid Glass–EVA–polymer stacks introduce additional micro-texture and thickness steps that also benefit from good melt wetting.

Tempered roller-wave / bow are common unevenness sources (EN 12150-type flatness concepts); severe mismatch still needs thicker film or better pairing — viscosity alone is not a cure-all.

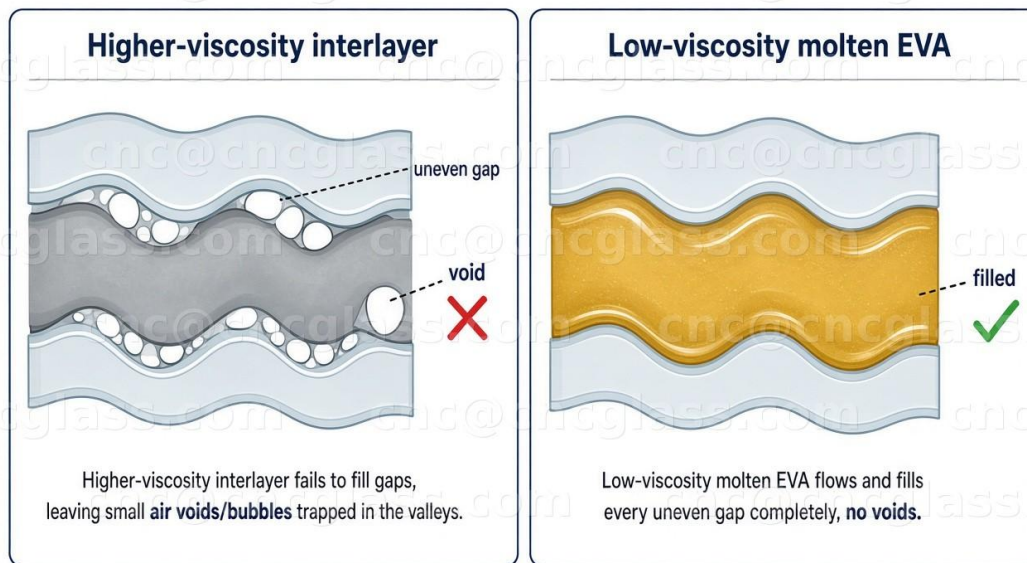
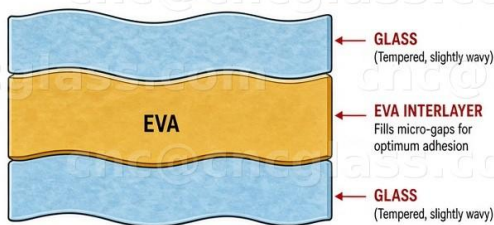


Figure 1 — Principle: low-viscosity molten EVA fills uneven tempered-glass gaps; a higher-viscosity interlayer is more likely to leave trapped voids.

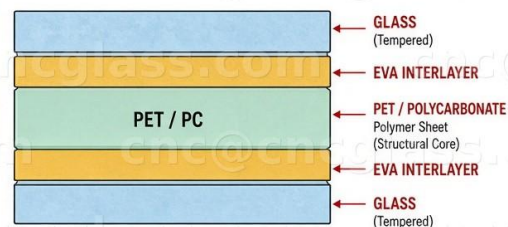
LAMINATED GLASS STACKS – CROSS SECTION

TWO COMMON CONFIGURATIONS

1. GLASS / EVA / GLASS



2. GLASS / EVA / PET-PC / EVA / GLASS



NOTE: Diagrams show typical cross-section construction. Actual thickness may vary by product and application.

Figure 2 — Cross-section stacks: Glass + EVA + Glass, and Glass + EVA + PET/PC polymer sheet + EVA + Glass.

CNCGLASS · 4. Bubble Reduction and Adhesion Coupling

The practical reason is flow into the contact plane: melted low-viscosity EVA can spread across the laminating sheet and fill uneven gaps more readily. That reduces the likelihood of trapped air bubbles in valleys and increases effective adhesive coupling because more of the glass (or polymer sheet) surface is wetted and bonded by the EVA film.

Bubble risk and peel strength still depend on cleaning, vacuuming quality, cycle temperature/time, film grade and thickness, and edge detail — not on viscosity alone. Low melt viscosity is an enabling property for uneven and insert builds; it does not replace process discipline.

CNCGLASS · 5. Process Notes — Vacuum-Oven EVA Routes

Architectural EVA is commonly laminated in vacuum-oven, vacuum-laminator, or vacuum-bag routes. High melt flow makes nip-roller de-airing unsuitable for most EVA grades: the melt can squeeze out of the glass edges like a soft filling. Design the cycle for controlled vacuum, staged heat, and adequate dwell so flow fills gaps before cross-linking locks the interlayer.

- Clean, dry bonding faces; exclude dust, fingerprints, and residues that block wetting.
- Match interlayer thickness to glass flatness and insert step height; consider thicker EVA or multiple plies for pronounced tempered distortion.
- For polymer inserts (PET, fabric, PC, acrylic, etc.), respect insert heat limits and use staged / lower-temperature cycles where required.
- Confirm outdoor vs indoor EVA grade, edge sealing practice, and required safety / durability evidence for the project.

Process notes summarize common vacuum-oven EVA practice; follow the film datasheet and line calibration for temperature–time–vacuum curves.

CNCGLASS · 6. Application Scenes

Low-viscosity EVA is especially useful wherever bonding faces are not optically flat or where decorative / structural inserts sit inside the laminate:

- Tempered laminated safety glass for façades, railings, canopies, and partitions where roller-wave flatness must be accommodated.
- Decorative laminates with PET graphics, fabrics, papers, or metal mesh encapsulated between glass.
- Hybrid Glass–EVA–polymer panels (PVC, PET, polycarbonate, acrylic) for lightweight or impact-tolerant interior builds.
- Textured or deep-surface glass where voids must be filled during bonding.



Figure 4 — Application scene: tempered laminated-glass safety railing / canopy façade where roller-wave flatness must be accommodated.



Figure 5 — Application scene: decorative laminated-glass partition with PET / fabric-style insert bonded by EVA.

CNCGLASS · 7. Practical Takeaway

Compared with PVB's more rubbery soften-and-press behavior, EVA's lower melt viscosity and higher melt flow help the interlayer wet and fill uneven tempered-glass and polymer-sheet interfaces. Used with a disciplined vacuum process and suitable film thickness, that flow supports fewer trapped voids and more complete surface coupling — which is why EVA is widely chosen for tempered and insert laminates. Final selection still follows project standards, durability class, and validated process windows.

CNCGLASS · Contact

Brand: CNCGLASS

Company: CNC Ucolin Interlayer Technology Co., Ltd.

Address: SHENZHEN, GD, CHINA

Contact: Peter Lin

Email: cnc@cncGlass.com

WhatsApp / WeChat / Mobile: +86 15013829504 · **WeChat:** wecan365

Website: www.cncglass.com

CNC Ucolin Interlayer Technology Co., Ltd. · SHENZHEN, GD, CHINA · Peter Lin