

CNCGLASS

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TECHNICAL NOTE

How-to DIY Portrait Laminated Glass (Fabricated Laminated Glass)

By Peter Lin

This professional how-to describes a practical vacuum-bag route to fabricated portrait laminated glass: a clean Glass + hot-melt EVA + dried photo insert (PP or PVC print media) + EVA + Glass stack, sealed in a silicone vacuum bag, heated in two stages, then cooled under vacuum before edge finishing with an EVA thermal cutter.



Figure 1. Example of fabricated EVA laminated glass with a decorative insert (held sample). The same Glass + EVA + insert + EVA + Glass lay-up applies to portrait photo inserts on PP or PVC print media.

CNCGLASS · Process Steps

1. Goal — enhanced portrait glass

What we are going to make: **enhanced portrait glass** (fabricated laminated glass with a portrait / photo insert).

The finished unit is a sealed safety-style laminate in which the portrait image is permanently encapsulated between two glass plies bonded by ethylene-vinyl acetate (EVA) interlayer film.

2. Photos — print media

If you print the portrait yourself, you need **PP print paper** and a suitable printer. You may also ask a printing company to produce the image. Prefer print media that is **PP or PVC**.

Do not use ordinary paper that sheds fibres or traps moisture. Confirm that the print substrate and inks withstand the EVA process temperature, and that inks are fully dry before lay-up.

3. Pre-laminate the portrait glass

Stack combination: **Glass + EVA film + Photo + EVA film + Glass**.

Wait until the photo ink is fully dry before stacking.

The EVA film used here is a **hot-melt adhesive interlayer film**.

Trim excess EVA film and photo flush with the glass edges.

Use high-temperature-resistance tape to **secure** the pre-laminated stack (do not leave the plies free to shift).

Cut inserts and EVA to match the glass outline; overhanging trim that is pulled hard can disturb the lay-up. Clean glass surfaces before stacking so fingerprints, cutting oil, or residual cleaner do not compromise adhesion.

4. Place in a silicone vacuum bag

Put the pre-laminated glass inside a silicone vacuum bag.

Seal the silicone vacuum bag.

Start the vacuum pump, double-check that vacuuming is working well, and confirm that the vacuum value reaches the **required value** for your equipment and process card.

Keep vacuum lines and bag seals free of leaks. If several small units share one bag, leave clearance between pieces so air paths remain open.

5. Heating in two temperature stages

Normally, heating is set in two stages:

Low-temperature stage: 60 °C for 15 minutes

High-temperature stage: 120 °C for 40 minutes

Follow oven controls so glass surface temperature tracks the programmed stages. Do not invent alternate set-points in place of this note's retained curve unless your EVA manufacturer process card specifies otherwise.

6. Cool under vacuum, then finish the edges

Stop heating and wait for the laminated glass to cool down.

Do **not** stop vacuuming until the laminated glass has cooled to **room temperature**. If vacuum is released too early, bubbles can appear inside the laminated glass.

Then remove the finished portrait laminated glass from the silicone bag.

Use an **EVA thermal cutter (also called hot knife, heat cutter, foam cutter, or fabric cutter)** to **get rid of** remaining overflow EVA at the edges.

Keep the bag closed and vacuum on through cool-down. Avoid quenching the hot laminate with cold water. After cool-down and bag opening, trim overflow carefully so the edge seal is not torn.

CNCGLASS · Materials Checklist

Prepare all materials before you start:

- PP or PVC print papers (photo / portrait media)
- Laminating oven
- Silicone vacuum bag
- Cleaned glass plies
- Ethylene-vinyl acetate (EVA) interlayer film
- High-temperature-resistance tape
- EVA thermal cutter / hot knife / heat cutter / foam cutter / fabric cutter

Optional accessories: Teflon mesh or equivalent breather path under small units so the vacuum port is not sealed shut by the bag face.

CNCGLASS · Key Process Controls

Ink dry before lay-up; PP/PVC print media only for the photo insert; hot-melt EVA on both faces of the insert; secure the stack with high-temperature tape; reach the required vacuum before heat; retain 60 °C / 15 min then 120 °C / 40 min unless your manufacturer curve says otherwise; cool to room temperature under vacuum; trim overflow with an EVA thermal cutter.

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