CNCGLASS

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TECHNICAL NOTE

Diagnosing Half-Clear Half-Haze SGP Laminated Glass: Autoclave Heating Fault

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

CNCGLASS · 1. The problem — half clear, half haze on one pane

Same glass build-up, **same roll of SGP (ionoplast) film**: the first production run was fully normal. A later run of the same configuration produced a pane that was **half optically clear and half hazy (雾)** — two completely different optical states in one laminate.

Workshop question: is the fault in the **SGP film**, the **glass**, or the **process / equipment**?

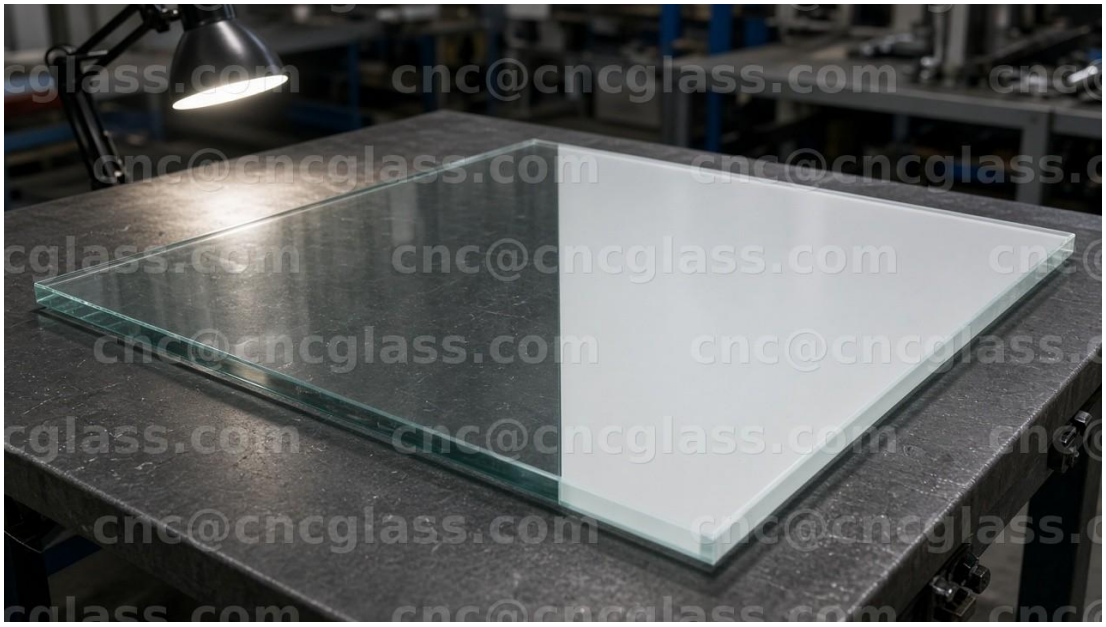

Figure 1 — Problem: same SGP laminate half clear / half hazy (雾) after autoclave.

CNCGLASS · 2. Triage — film lot vs glass vs process / equipment

CNCGLASS technical service went on site and checked materials, process parameters, and equipment condition in order.

- **Film lot:** Same roll already produced a clear, acceptable laminate in the first run. That is strong evidence against a bad film lot as the root cause of a later half-and-half defect.
- **Glass:** Same build-up as the good first run. Unless a new glass lot with severe bow/contamination appears mid-job, glass alone rarely creates a sharp clear/haze split across one autoclave zone.
- **Process / equipment:** A sudden change after a good first run points to autoclave temperature history — heaters, fans, circulation, sensors, or racking that creates hot and cold zones on the same pane.

Figure 4 — Triage checklist: film lot vs glass vs process / equipment.

CNCGLASS · 3. Why under-temperature zones look hazy

Ionoplast SGP needs the interlayer to reach the intended autoclave soak temperature for long enough to bond and clear optically. Autoclave soak temperature, soak time, racking, and airflow all affect optical and physical results. Chamber set-points alone are not enough — embed a thermocouple in the real laminate build-up when diagnosing zone defects.

Published ionoplast processing guides typically cite autoclave soak about **132–135 °C** at roughly **12–14 bar** with hold **≥60 minutes** (longer for thick / multi-ply), and note that final haze is also strongly linked to cooling rate and unobstructed airflow (properly sized fan; keep fan and cooling water on until laminates are near ambient). High haze can often be reduced by a re-autoclave if cooling meets the recommended rate.

A sharp half-and-half appearance on one pane fits a spatial temperature (or cooling) split: one side reached a clear melt / clear cool-down path; the other stayed in a cold or poorly circulated zone.

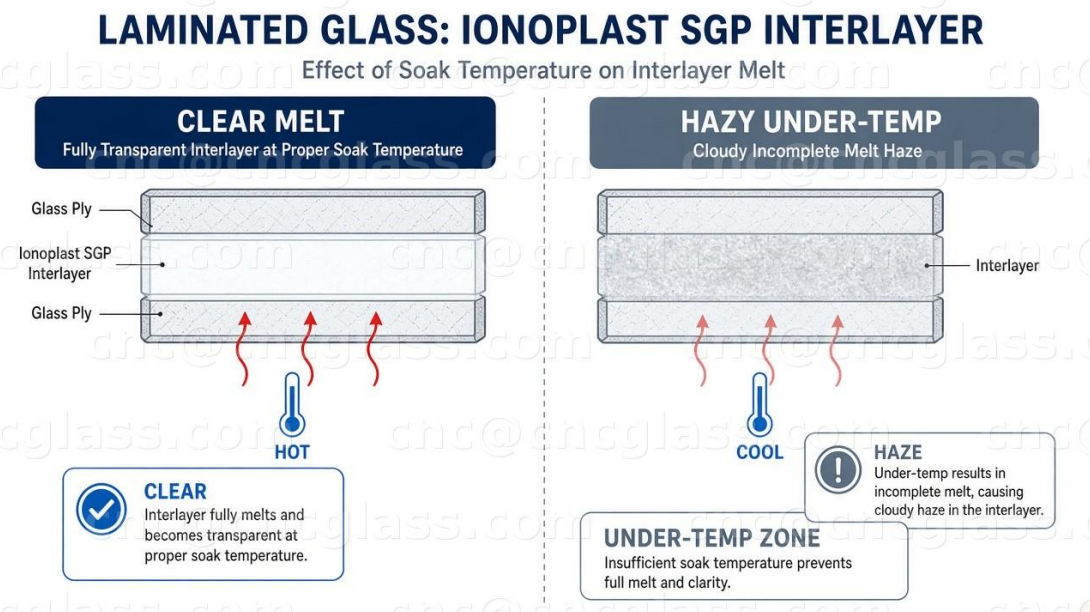

Figure 2 — Principle: clear melt at proper soak vs cloudy haze in an under-temperature zone.

CNCGLASS · 4. Field diagnosis — autoclave heating system fault

Root cause on this job: the **autoclave heating system had a fault**, so glass inside the vessel heated severely unevenly. One region of the pane cleared; the other stayed hazy.

Forced-air autoclaves rely on heaters plus a fan and duct path to move hot air through the load. Heater-bank failure, blocked ducts, failed fan, or packing that blocks circulation creates hot and cold zones. Industry guidance stresses continuous air circulation, adequate spacing between packs, and not blocking flow channels — otherwise local haze, bubbles, or adhesion defects appear.

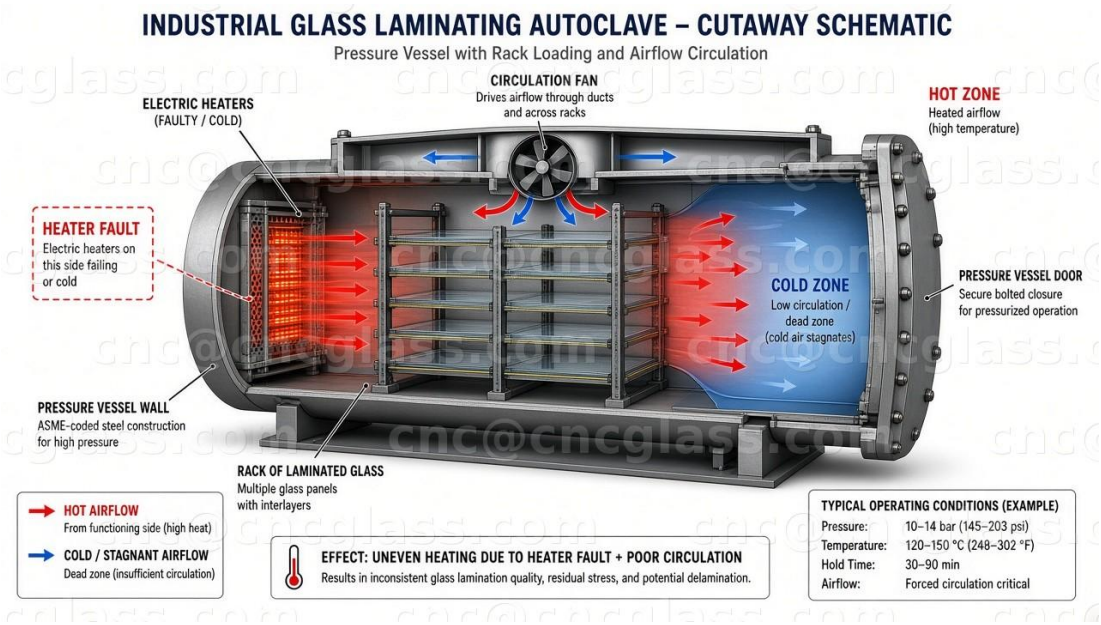

Figure 3 — Diagnosis: autoclave heater / circulation fault creates hot and cold zones.

CNCGLASS · 5. Corrective action — clear the fault, then retune

CNCGLASS technical service helped the client clear the heating fault and adjust process parameters. After the repair and retune, laminates returned to **uniform clarity** and met delivery acceptance.

- Repair / replace failed heater elements, contactors, or zone controls; verify each bank draws current.
- Check fan motor, belt/coupling, and ducting; confirm airflow across the full rack length.
- Map chamber temperature with multiple sensors or a laminate-embedded thermocouple before releasing production.
- Only after hardware is healthy, retune soak/hold/cooling and re-validate a first-article pane.

CNCGLASS · 6. Lesson — maintain laminating equipment on a schedule

Good interlayer and good glass cannot overcome a broken heater or blocked circulation. Routine maintenance, inspection, and repair of autoclave heaters, fans, coolers, and sensors are part of producing clear SGP laminates — not optional extras.

- Daily: review cycle charts for zone spread; listen for fan anomalies; note any one-sided haze on unload.
- Periodic: heater resistance / current checks; fan and radiator flush (cooling side); sensor calibration.
- After any heater or fan repair: run a temperature-uniformity check with a loaded rack before shipping glass.

CNCGLASS · 7. Workshop checklist — half-clear / half-haze

- Confirm film roll ID matches a prior good run before blaming the interlayer.
- Confirm glass build-up and cleaning match the good first article.
- Inspect autoclave heaters, fan, ducts, and rack spacing for cold zones.
- Verify laminate-core temperature vs chamber set-point with a thermocouple.
- Clear equipment faults first; then adjust soak / cooling parameters.
- Keep a written PM schedule for heaters, fans, and coolers — and follow it.

Figure 5 — Application: clear structural SGP facade / canopy laminated glass.

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