

Use of Internal Grilles

Internal grilles in an insulating glass unit are known by many names: grilles, muntin bars, simulated divided lites, shadow bars, contour bars, and grilles between glass (GBG). When internal grilles are used in an insulating glass unit there is a potential these dividers will contact the airspace glass surfaces (surface #2 or #3) of the unit. This can occur under a number of conditions:

- When the IG unit is exposed to atmospheric pressure above that at which it was constructed including cold temperature conditions and high barometric pressure conditions
- Installation at an altitude below its fabrication altitude
- High and buffeting winds
- Use of tempered glass with some level of bow
- Fabrication at or near the IG thickness lower limit

When the grilles contact the airspace glass surfaces, there is the potential for having condensation on the room side (#4 glass surface) immediately behind the grille. This is because the insulating glass unit will lose insulating value where the grille contacts the glass surfaces, causing the indoor glass surface to be colder.

In addition, in units with large glass utilizing long spans of the internal grilles, there is a chance for brief glass to internal grille contact. Swinging or sliding patio doors that are rapidly swung open or shut could result in the grille contacting the glass resulting in a brief rattling noise. This brief rattling noise is not a product defect and does not warrant replacement of the glass.

The use of thick glass with tape applied external grilles will affect the illusion of a continuous bar. Because the glass is clear with thicker glass, the wider the apparent gap between the applied bar and internal grill will appear.

This is illustrated in Figure 1 below. Angle \emptyset is the angle from the glass surface where a viewer will be able to see light between the internal grille and applied bar, breaking the illusion of a continuous bar.

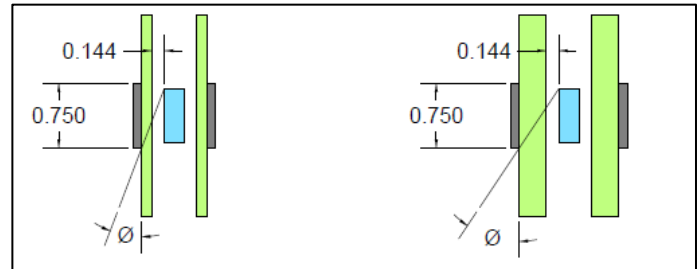


Figure 1, In both cases: 0.522" airspace and 0.235 x 0.625" internal grille. Left utilizes 3mm (0.117") glass and right 8mm (0.296") glass.

In the case shown, going from 3mm to 8mm increased this viewing angle \emptyset from 20° to 33°. The sharper (smaller) this angle is, the closer to the glass you will need to be to break the illusion of a continuous bar. To overcome this, the applied grilles should be wider as glass becomes thicker to maintain this angle as low as possible.

Simulating Windows with Grilles

Insulating glass units using internal grilles may or may not have the same rated U-Factor. The National Fenestration Rating Council's *Procedure for Determining Fenestration Product U-Factors (NFRC 100)* states if there is at least a 3.00 mm (0.118") gap between the internal grille and glass, the U-factor is the same as an IG unit without dividers.

Determining what grilles are available to consumers and if the 3.00 mm gap requirement will be met are decisions made by the window manufacturer.

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