

Sandblasting of Tempered Glass

Sandblasted glass surfaces provide varying aesthetics for interior divider panels, privacy and other architectural applications. When using these processes, understanding the effect on glass strength is an important issue. Tempering glass creates an equilibrium condition in which the forces across any section of the plate must be balanced. This results in a surface compression and balancing center tension stress condition within the glass body that improves its surface strength. The compression envelope surrounding the center tension layer equals approximately 20% of the glass thickness through each surface of the glass.

When sandblasting glass, Vitro (formerly PPG Industries) recommends sandblasting the annealed glass before tempering. This allows thermal strengthening to “heal” some of the surface damage created by the decorative process. Post tempered sandblasting (sandblasting after tempering) can cause the glass to bow due to a significant shift in the surface compression resulting from the decorative surface alteration. Sandblasting after tempering can lead to additional, and possibly immediate, breakage; e.g., during framing operations.

If fabricators choose to sandblast after tempering, a limit on the depth of the sandblasting to 10% of the glass thickness should be considered. This consideration may suggest a limit of 1/64-inch (0.4mm) for glass less than 1/4” (6mm) thick. Similarly, a limit of 1/32-inch (0.8mm) for glass greater than or equal to 1/4” (6mm) thick may be

considered. Additionally, the use of the finest (smallest particle size) grit material and lightest application pressure possible result in less surface damage and, consequently, less resultant reduction of glass strength, as compared to larger particle sizes and/or higher pressure.

Table 1 provides strength reduction factor guidelines, comparing tempering the glass after sandblasting and tempering the glass before sandblasting to tempered glass which has not been sandblasted.

Table 1	
Strength Reduction Factor Guidelines	
<i>Process Sequence</i>	<i>Factor</i>
Tempered, NOT Sandblasted	1.0
Sandblasted, then Tempered	0.9
Tempered then Sandblasted	0.7

Sandblasting tempered glass requires great care during processing. The depth of the sandblasting is critical. The deeper the sandblasting, the more glass strength is sacrificed and compromised. Sandblasting through the depth of the compression layer and into the tension zone of tempered glass will result in severe loss of glass strength and subsequent glass breakage.

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HISTORY TABLE		
ITEM	DATE	DESCRIPTION
Inside Glass 95-1	3/31/95	Sandblasting of Tempered Glass
TD-125	5/8/2002	Transferred to Internet – minor changes
Revision 1	2016-10-04	Updated to Vitro Logo and format

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