

Standard Test Procedure for 3/8” and 1/2” Glass Deflection

Deflection Test

Scope: The criteria for development of this standard are:

1. To limit glass deflection to that acceptable for the visual and psychological limitations of the user.
2. To limit deflection so that degradation of the mounting clips and channels does not occur.

Test Procedure:

Testing was done with a structural steel, “L” shaped, welded frame. The glass was attached to the frame by using three CRL shower panel clips along the long edge (one at the center point and the other two at 8 inches on center from the ends.). The short edge had two clips (located as above).

Glass deflection was accomplished by using a low pressure, compressed air ram with a certified gauge pushing against the unsupported corner of a lite of glass that was supported by clips on one short and one long edge. Pressures were determined that would result in a force of 25, 50, 75 and 100 pounds of force. It was determined that the 100 pound was sufficient to permanently bend the brass clips without breaking the tempered glass, so this pressure level was eliminated after the first test.

3/8” Clear Tempered	Size: 24 x 84	
PSI	Force (pounds)	Deflection (inches)
14.14	25	5/8”
28.28	50	1-3/8”
42.42	75	2-1/16”

3/8: Clear Tempered	Size: 30 x 84	
PSI	Force (pounds)	Deflection (inches)
14.14	25	7/8”
28.28	50	1-3/4”
42.42	75	2-3/8”

3/8: Clear Tempered	Size: 36 x 84	
PSI	Force (pounds)	Deflection (inches)
14.14	25	1-1/8”
28.28	50	1-7/8”
42.42	75	2-13/16”

1/2” Clear Tempered	Size: 36 x 84	
PSI	Force (pounds)	Deflection (inches)
14.14	25	1/2”
28.28	50	1-1/16”
42.42	75	1-5/8”

1/2” Clear Tempered	Size: 42 x 84	
PSI	Force (pounds)	Deflection (inches)
14.14	25	1/2”
28.28	50	1-1/16”
42.42	75	1-5/8”

Summary:

*During these tests, it was obvious that the 3/8 inch (9mm) clear tempered in 30 inches (648mm) x 84 inches (2134mm) and 36 inch (914mm) x 84 inches (2134mm) was too flexible to be psychologically satisfactory. While the glass will withstand sufficient force to be deemed “safe”, the amount of deflection from casual push-pull actions created unacceptably large amounts of glass movement. Although the glass did not break, potential clip damage can occur, as well as, and degradation of silicone seals in channel sets. Therefore, 1/2 inch (12mm) tempered glass was set as the standard for two side support over 24 inch (610mm) in width.

***Note:** In a 50% increase in force over the 75 pound test, the glass deflected 3 inches (76mm) without failure. Tempered glass is not the problem. It will withstand considerably more force than the mechanical fasteners or human tolerance can endure.