

Pressure Application Guidelines

3MTM VHBTM Structural Glazing Tape

3MTM VHBTM Structural Glazing Tape (VHB SGT) is a durable, closed-cell acrylic adhesive. Unlike liquid-applied adhesives, VHB SGT is a fully-cured pressure sensitive adhesive which relies on making good contact to both the glass and metal surfaces to create a strong adhesive bond. The weight of the glass alone will typically result in some contact of the tape to both substrate surfaces. However, 3M never solely relies on the weight of the glass and always requires that equipment be utilized to apply final pressure to the bonded components.

The purpose of this document is to provide guidelines to assist applicators of VHB SGT in choosing an appropriate method of pressure application based on project needs and specific system requirements. It is the responsibility of the applicator to choose a method that achieves sufficient contact between the glass panel and metal frame to meet the minimum requirements from 3M and the system manufacturer.

Please note: 3M does not recommend nor endorse any particular method or equipment manufacturer; however, it reserves the right to deem a customer-selected method ineffective if sufficient contact isn't achieved between the glass panel and metal frame, and may require a different method, without recourse. If necessary, 3M will advise the Project Team of the deficiency.

The following provides basic terms and definitions associated with pressure application for VHB SGT, and examples of different methods by category type:

Typical Glazing Systems

Cassette Systems: An aluminum channel assembly (cassette frame) that is bonded to glass or other infill panels by means of VHB SGT in a shop environment. The cassette frame/glass panel assembly is later fixed to a structural framing system that is already installed on the jobsite using clips or toggles followed by field-installed silicone weatherseal in exterior perimeter joints to create a frameless look from the exterior.

VHB SGT is typically applied to the cassette frame and then lowered onto the glass panel, which is then pressure-set to achieve sufficient contact between the glass panel and metal frame. The most common method is to use a handheld pneumatic rolling device, such as from Developmental Industries or Vulkan Technic; however, handheld clamps can accomplish the task as well.

Unit or Frame System*: Typically, a method of joining two verticals with a series of horizontal members to create a unit or frame; sometimes known as a ladder. VHB SGT is applied to the unglazed unit frame assembly and the glass panel is then lowered onto the tape, which is followed by pressure application to achieve sufficient contact between the glass panel and metal frame.

(continued) Pressure can be applied using commercially available top-down force equipment from Erdman Automation and Project Vision Dynamics or the applicator may devise their own method. Vacuum tables have also been utilized for pressure application if the condition is suitable, such as the absence of pre-installed shadow boxes or backpans. It should be noted that vacuum tables may develop cleavage providing uneven pressure across the bonding surface of the tape and may require follow up clamping at corners and intersections to achieve full contact between the metal and glass substrates.

*** Note: Back of glazing pocket alignment must be within .015" at each framing intersection.**

Important Terms

Initial Pressure Application: Following the application of the VHB SGT to the first substrate (metal frame or glass panel), application of initial pressure must be completed. Apply a roll down force of at least 15 lbs with a dense J-roller (Gundlach V300-SB pressure roller or similar laminate roller) over the entire VHB SGT area to ensure good contact between the tape and the first substrate surface. Bubbles (entrapped air), if present, can be removed at this point by making a small length-wise slit in the tape through the bubble and then working out the air with light finger pressure. VHB SGT is self-fusing and will heal when pressure is applied.

Final Pressure Application: Any method that achieves sufficient contact between metal and glass/infill panel systems. Methods that develop a known and repeatable pressure to the tape bond area are preferred over those that do not. *Note: it is the responsibility of the applicator to develop sufficient pressure. Any method that does not provide sufficient contact will be deemed unsuitable and may result in 3M not approving the application.*

Sufficient Pressure: The amount of pressure required to achieve what is typically known as wet-out or acceptable contact. This can be observed as the surface of the tape turns shiny, or more clear, with a uniform appearance. 3M requires 90% contact for structural bonding to be recognized. Typically, this is achieved by the application of >15 psi at the VHB SGT tape bond line (i.e., between the metal frame and glass/infill panel). This pressure can be measured or verified using pressure-sensing film.

Equipment/Tools

The following is a brief list of possible methods of pressure application. As previously stated, it is the responsibility of the applicator to insure a sufficient method is utilized to develop a minimum of 90% contact (wet-out). 3M reserves the right to reject, without recourse, any method that does not achieve sufficient pressure to achieve minimum contact resulting in loss of warranty and a request for work stoppage.

Hand Held Tools: Any device, manual or pneumatic, that can yield the pressure equivalency of 15 psi at the tape interface between the bonding substrates. 3M recommends using a pressure application method with measurable verification. *J-rollers are only used to provide initial pressure when there is direct access to the tape (i.e., the tape is only applied to one substrate surface) and not acceptable for final pressure application.*

Developmental Industries: Pneumatic: SGT-PPA-150 <http://projectvisiondynamics.com/wp-content/uploads/2017/01/SGT-PPA-150-Pressure-Applicator.pdf>
Typically only suited for cassette or shallow window systems. ~\$3000

Vulkan Technic: Pneumatic: Series SGA 350 Hand Presser info@vulkantechnik.de
<http://projectvisiondynamics.com/wp-content/uploads/2017/11/Vulkan-SGA-350-Brochure.pdf>
Typically only suited for cassette or shallow window systems. ~\$3000

J-Rollers: Manual: Example: Gundlach V300-SB Pressure Roller. Available through 3M Select Distributors for under \$30

Clamps: Manual: Example: Irwin Quick-Grip XP600 12" Clamp —develops up to 600 lbs of constant pressure. Available through multiple suppliers

Top-Down Pressure Tools: Any device that applies a force from the top that can yield the pressure equivalency of 15 psi at the tape interface between the bonding substrates. 3M recommends using a method with measurable verification.

Erdman Automation: Pneumatic: Erdman Commercial Pressure Roll Down fixed table that receives the unit or frame.
<http://www.erdmanautomation.com/pressure-roll-down.html> Contact directly for pricing.

Project Vision Dynamics: Pneumatic: PVD EZ Glide Gantry Press. Rolling gantry or fixed options with automated continuous pressing. www.ProjectVisionDynamics.com
Contact directly for pricing. Rental program available.

Vacuum Tables No commercial options; however, they can be easily made using gaskets at the bottom of the frame to create a seal with pressure developed by a standard shop vacuum connected to a hole underneath the glass.

Special Notes: Vacuum tables may create a cleavage condition, which develops greater pressure on the inside edge of the tape versus the outside edge. Such a condition results in uneven pressure and the potential for incomplete contact; especially at the corners. It is recommended that a clamping device be used within 6 - 12" of each corner to develop even pressure and full contact.

When backpans or shadow boxes are utilized, vacuum tables require the glass be pressure-set BEFORE they are installed.

If spandrel or metal panels are used as infill, this method doesn't provide an opportunity for visual inspection, which is why top-down (cleavage-free) pressure is the best practice in this condition.

While vacuum tables do not provide a measurable and repeatable amount of pressure over the whole tape area, with care and attention to detail, they can be suitable for many applications.

Of note: Some applicators that have used vacuum tables in the past are moving away from them because of inconsistent pressure around the perimeter of the glass panels; in particular, the corner areas, which receive much less overall applied pressure compared to the center perimeter areas of the panels. This results in the need to use Irwin bars clamps in the corners after applying the vacuum pressure because there are usually visible noncontact areas of the tape to the glass panels. The vacuum pressure usually needs to be in the 15" – 18" of water range.

The following pictures are examples of tables that have been fabricated and used by applicators:

