

3M Science.
Applied to Life.™



3M™ VHB™ Tape for Smooth-Sided Trailers

**Smooth look.
Smooth ride.
Confidence.**



3M™ VHB™ Tapes give trailer buyers what they want — smooth trailers.

Using 3M™ VHB™ Tape for panel attachment can give your trailer a smooth look with improved durability and a potentially quieter ride.

Whether they haul horses, tools, equipment or racing vehicles, trailer owners know what they want. 3M solicited third-party research of trailer owners and here are the results:

Horse trailer owners want:

1. Durability
2. Horse comfort and safety
3. Aesthetics



Cargo trailer owners want:

1. Durability
2. Aesthetics

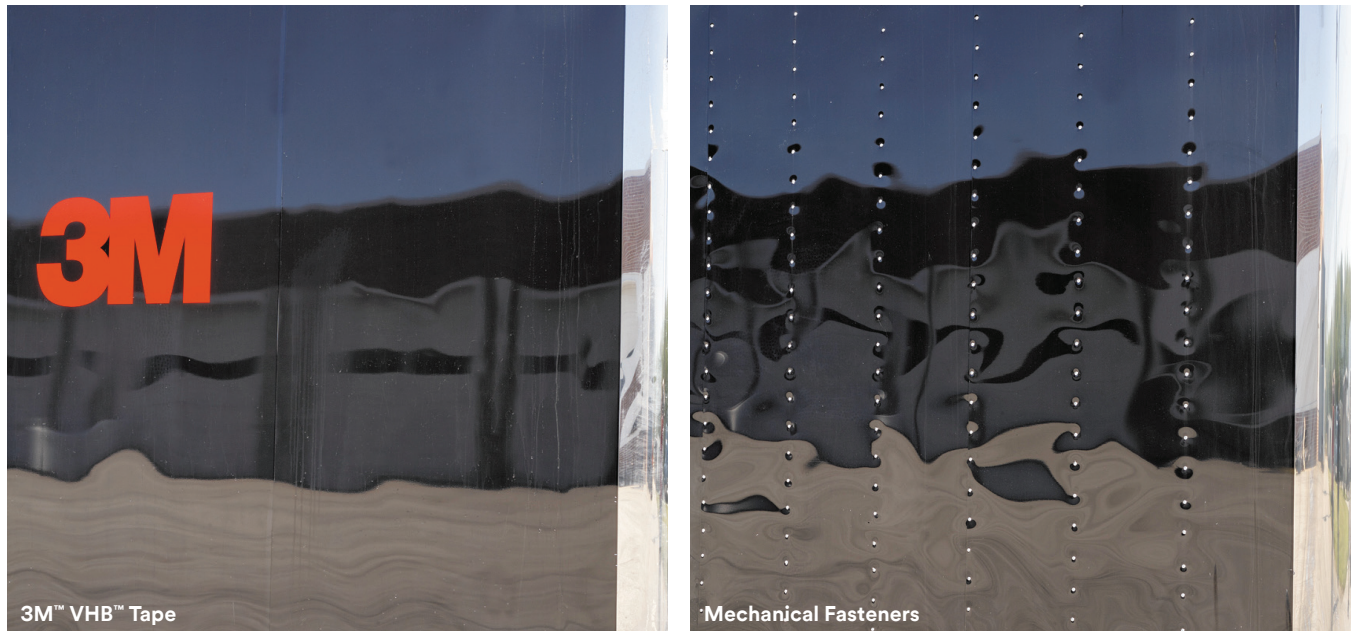


“We don’t have to use rivets now. We don’t have to have any kind of screws anywhere to hold us together. The 3M™ VHB™ Tape does it.”

— Lonnie Troyer, ShowHauler Sales Manager

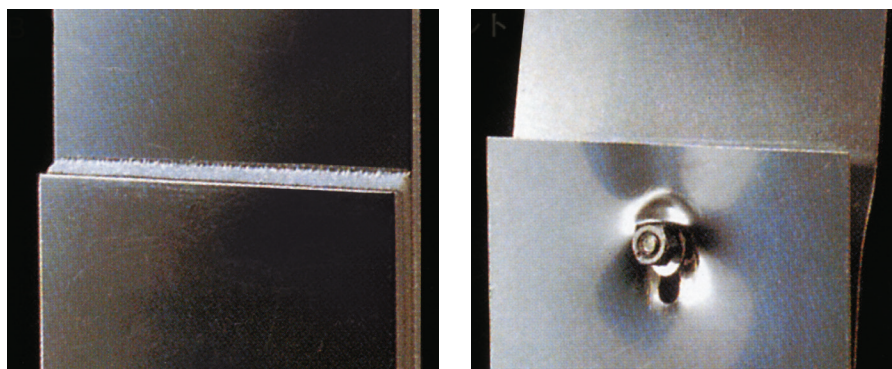
Smooth Sided (3M™ VHB™ Tape) vs. Mechanically-Fastened

Compare the reflections of the smooth-sided trailer at left made with 3M™ VHB™ Tape and the mechanically-fastened trailer at right. Smooth sides convey a professional appearance and quality construction, as well as improve the installation and look of graphics.



Quick Glance Comparison

Customer Wants	3M™ VHB™ Tape	Mechanical Fastener
Durability	Flexes with thermal expansion and contraction	May become loose during thermal expansion and contraction
	Absorbs vibration; helps maintains the bond and seals against water and dirt intrusion	May become loose over time which can lead to leaks
	Separates dissimilar metals to help prevent galvanic corrosion	Dissimilar metals can come in contact leading to galvanic corrosion
Aesthetics	Smooth appearance even in the sun's heat	Expands into a quilted pattern in the sun
	Improved appearance of graphics	Surface dotted with rivets and screws
Reduced Noise	Taped panels stay tight helping to reduce rattling	Rigid metal-to-metal attachment of mechanical fasteners transfer sound
	Viscoelastic tape properties help provide sound damping	



Under equal stress conditions, metal panels bonded with 3M™ VHB™ Tape show no visible signs of stress compared to those with mechanical fasteners.

How is a smooth trailer made?



For more than 35 years, leading trailer manufacturers have relied on 3M™ VHB™ Tape for assembly of durable, smooth-sided trailers. 3M™ VHB™ Tape is an alternative to screws, rivets, welds and liquid adhesives. The tape is used to bond side panels to posts and panel to panel on overlap seams. 3M™ VHB™ Tapes are made with acrylic foam adhesive with unique viscoelastic properties and outstanding durability. This gives the foam energy absorbing and stress relaxation properties that protect the bond by absorbing vibration, dynamic loads (wind), movement due to trailer flex, and thermal expansion/contraction. The end result is a smooth and durable trailer side wall assembly that will serve their customer for years.



Ease of Building with 3M™ VHB™ Tape

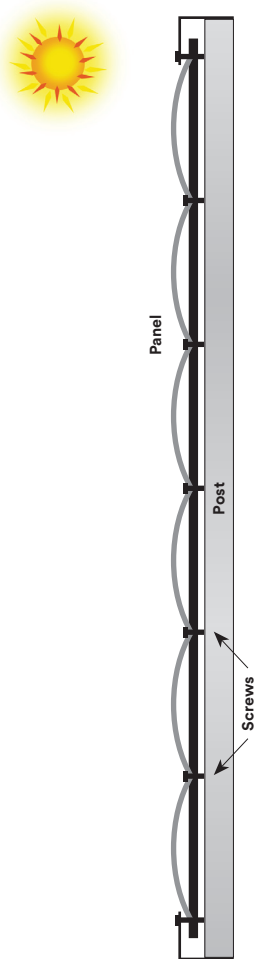
Attaching 3M™ VHB™ Tape is different than attachment using rivets or screws. Our experience has shown that once a crew gets the hang of it, the time of assembly is about the same as mechanical assembly. There is less drilling on the line, which means less noise in the factory and reduced chances for operators to develop carpal tunnel syndrome.



“3M™ VHB™ Tape is really easy to work with. I don’t even have to think about it.”

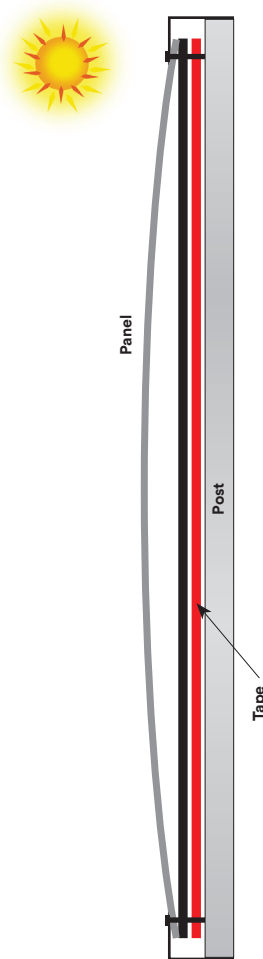
— Aaron Todd, ShowHauler Production

Optimizing smooth panel attachment with unconstrained construction.



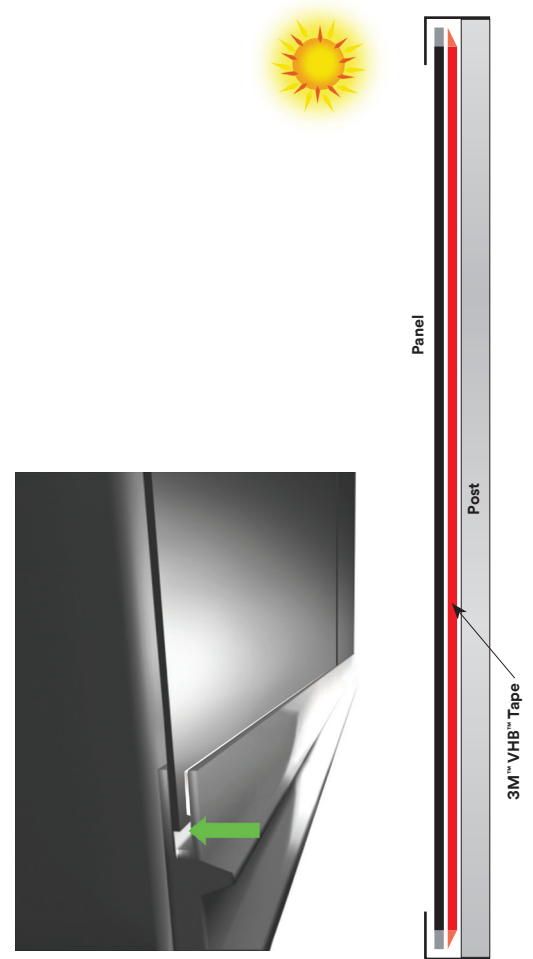
Traditional mechanical fasteners

Results in pillowing and cause stress points that can weaken with time and vibration.



Constrained construction

Creates seam popping. Panel expansion increases stress on the taped seams that can lead to panel separation.



Unconstrained construction with 3M™ VHB™ Tape

Much more durable. Mechanical fasteners are completely eliminated, helping to reduce expansion forces on the seams and ensure a long lasting bond.



Result:

The unconstrained panel design using 3M™ VHB™ Tape was found to be the most durable smooth panel attachment system.

Stands up to the highest standards.



To prove the durability of the unconstrained design, 3M sent two trailers to the Bosch Automotive Proving Grounds in South Bend, Indiana. The side panels on one test trailer were attached with 3M™ VHB™ Tapes. Panels on the other test trailer were mechanically fastened. An independent test team at Bosch performed durability testing over various road conditions and exposure to heat cycling.



Road Condition Durability Testing

Testing parameters for heat cycle and road condition durability

- Instruments were attached inside each trailer to detect changes in side panel position or dynamics
- Trailers were overloaded 120%
- Series of road tests simulated hauling 100,000 miles



Road construction simulation.

“There’s been the occasional issue where we have to actually use a forklift to pull the sidesheets off the steel structure.”

— Scott Cronin, ShowHauler R&D

Pressure Washer Testing

After the 100,000 mile road test

- A pressure washer set at 3,200 PSI sprayed water over each seam of the smooth-sided trailer
- No leaks were detected



Pressure washer set at 3,200 PSI.

“3M™ VHB™ Tape is foam composition. We don’t have to worry about water being inside and around it like we do with other sealants.”

— Scott Schaefer, Voyager Industries



Result: After a simulated 100,000 miles of different road conditions, non-constrained 3M™ VHB™ Tape panel construction held tight preventing leaks, absorbing vibration and reducing noise.



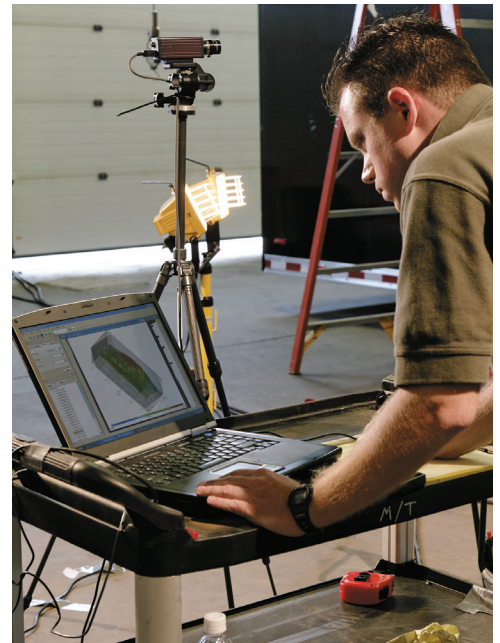
33% of the mechanical fasteners were loose at 36,000 miles.



3M™ VHB™ Tape — Unconstrained Construction



Mechanical Fasteners



Thermal Cycling Durability Testing

- Trailers were placed in an enclosed environmental chamber and exposed repeatedly to temperature cycling after 36,000 miles
- Heaters radiated up to 190°F to simulate the sun's heat against the trailer (30 cycles repeated for each side)



Result:

Unconstrained design looks great and stays strong in extreme heat.



Heaters radiated up to 190°F.

Noise and Vibration Testing

- Horse trailer assembled using unconstrained 3M™ VHB™ Tape construction
- Tested at highway speeds by independent noise vibration expert

According to horse experts, reducing noise and vibration during transport could help reduce stress and fatigue for horses. This can result in shorter recovery times before shows, races or other events.



Result:

3M™ VHB™ Tape assembled trailer is up to **41% quieter** at highway speeds and reduces vibration up to 30% when compared to a mechanically fastened trailer.



Dream. Design. Deliver.



Thanks to the science behind 3M Industrial Adhesives and Tapes, we offer the freedom to imagine, to design and to build.



The confidence of a warranty from 3M.

Based on the track record and recent testing results, 3M now offers a 36-month warranty to qualified manufacturers with properly assembled panels.

3M™ VHB™ Tape and 3M™ Extreme Sealing Tape Application Tool Kit

Everything you need for applying tape successfully.



Product Information

3M™ VHB™ Commercial Vehicle Tapes

Product	Tape Thickness Without Liner mils (mm)	Description	Adhesive Type	Temperature Resistance		Solvent Resistance	Application Ideas
				Minutes/Hours	Days/Weeks		
CV45F	45 (1.1)	Gray, closed-cell acrylic foam carrier. Conformable. Good adhesion to many painted metals.	Acrylic	300°F (149°C)	200°F (93°C)	High	Bond overlap seams on vehicle side panels
CV62F	62 (1.6)	Gray, closed-cell acrylic foam carrier. Conformable. Good adhesion to many painted metals.	Acrylic	300°F (149°C)	200°F (93°C)	High	Bond vehicle side panels to posts

Product	Description
3M™ VHB™ Tape and 3M™ Extreme Sealing Tape Application Tool Kit	Kit contains: Soft Roller with Cover, 3M™ Hand Applicator PA1-B Blue, Plastic Spray Bottle with Nozzle, File Cleaner, Scotch-Brite™ Hand Pad 7447 and Power Roller (J-Roller)

Product Selection and Use: Many factors beyond 3M's control and uniquely within user's knowledge and control can affect the use and performance of a 3M product in a particular application. As a result, customer is solely responsible for evaluating the product and determining whether it is appropriate and suitable for customer's application, including conducting a workplace hazard assessment and reviewing all applicable regulations and standards (e.g., OSHA, ANSI, etc.). Failure to properly evaluate, select, and use a 3M product and appropriate safety products, or to meet all applicable safety regulations, may result in injury, sickness, death, and/or harm to property. **Warranty, Limited Remedy, and Disclaimer:** Unless a different warranty is specifically stated on the applicable 3M product packaging or product literature (in which case such warranty governs), 3M warrants that each 3M product meets the applicable 3M product specification at the time 3M ships the product. 3M MAKES NO OTHER WARRANTIES OR CONDITIONS, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OR CONDITION OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, OR ARISING OUT OF A COURSE OF DEALING, CUSTOM, OR USAGE OF TRADE. If a 3M product does not conform to this warranty, then the sole and exclusive remedy is, at 3M's option, replacement of the 3M product or refund of the purchase price. **Limitation of Liability:** Except for the limited remedy stated above, and except to the extent prohibited by law, 3M will not be liable for any loss or damage arising from or related to the 3M product, whether direct, indirect, special, incidental, or consequential (including, but not limited to, lost profits or business opportunity), regardless of the legal or equitable theory asserted, including, but not limited to, warranty, contract, negligence, or strict liability.



3M Industrial Adhesives and Tapes Division
3M Center, Building 225-3S-06
St. Paul, MN 55144-1000

Phone 800-362-3550
Fax 877-369-2923
Web 3M.com/VHB

3M, Scotch-Brite and VHB are trademarks of 3M Company. Please recycle. Printed in USA.
© 3M 2017. All rights reserved. 70-0709-3997-3 July2017