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.

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**Quick Glance Comparison**

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

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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

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

“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

“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.
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.

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.
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

<table>
<thead>
<tr>
<th>Product</th>
<th>Description</th>
<th>Tape Thickness Without Liner (mils (mm))</th>
<th>Adhesive Type</th>
<th>Temperature Resistance</th>
<th>Solvent Resistance</th>
<th>Application Ideas</th>
</tr>
</thead>
<tbody>
<tr>
<td>CV45F</td>
<td>Gray, closed-cell acrylic foam carrier. Conformable. Good adhesion to many painted metals.</td>
<td>45 (1.1)</td>
<td>Acrylic</td>
<td>300°F (149°C)</td>
<td>High</td>
<td>Bond overlap seams on vehicle side panels</td>
</tr>
<tr>
<td>CV62F</td>
<td>Gray, closed-cell acrylic foam carrier. Conformable. Good adhesion to many painted metals.</td>
<td>62 (1.6)</td>
<td>Acrylic</td>
<td>300°F (149°C)</td>
<td>High</td>
<td>Bond vehicle side panels to posts</td>
</tr>
</tbody>
</table>

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