Dan Braker
Breakthrough Research
Maximizing Usage of Pressure-Sensitive Adhesive Tape in the Automotive Vertical

Key Research Findings
BACKGROUND & METHODOLOGY
In 2016, Breakthrough Research conducted a comprehensive quantitative research study for the PSTC to identify the primary growth opportunities for pressure-sensitive adhesive tapes. That study suggested that automotive, appliances, and construction verticals all represented potentially attractive areas on which to focus.

This follow-up research seeks to further define opportunities in the automotive vertical – similar to a 2017 study focused on the construction/building vertical.

**RESEARCH OBJECTIVES**

1. **PRIORITIZE** the bonding needs for PSA Tapes in the automotive vertical

2. **UNDERSTAND** the perceived suitability of PSA Tape for automotive applications and the key barriers to conversion

3. **IDENTIFY** the information and evidence of value that would maximize the adoption of PSA Tape in the automotive industry

4. **IDENTIFY** the most effective channels for reaching specifiers in the automotive vertical
METHODOLOGY

20-MINUTE ONLINE AND/OR B2B PHONE PANELS SURVEY among a total of n=157 respondents

Interviews were collected from: August 10th – September 2nd, 2019

Respondents were recruited from multiple nationally representative online panels.

RESPONDENT QUALIFICATIONS

• Engineers, Designers, Specifiers, or Converters working in Automotive

• Have decision-making responsibility for the bonding solutions used in their projects

• Have worked on at least one project for which bonding solutions were specified in the past year

Company Type

<table>
<thead>
<tr>
<th>Tier 2/3</th>
<th>Tier 1</th>
<th>OEM</th>
<th>Converter</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>15%</td>
<td>31%</td>
<td>43%</td>
<td>6%</td>
<td>4%</td>
</tr>
</tbody>
</table>

Types of Automotive Projects

<table>
<thead>
<tr>
<th>Electrical</th>
<th>Engine</th>
<th>Exhaust</th>
<th>Finish &amp; Trim</th>
</tr>
</thead>
<tbody>
<tr>
<td>55%</td>
<td>58%</td>
<td>28%</td>
<td>81%</td>
</tr>
</tbody>
</table>
USAGE PATTERNS & SELECTION FACTORS
PSA Tapes are underused vs. competing solutions across nearly every application category, particularly for joining/affixing but are chosen slightly more often than competing solutions for identifying/labeling.

C4. How often do you specify/use the bonding solutions shown below for [APPLICATION] applications in your automotive jobs or projects? (Frequently/Aprilways)
Performance requirements are the top selection factor for bonding solutions across applications in the automotive vertical, specifically:

#1 Bond durability

#2 Be able to apply/set fast

#3 Ability to withstand environmental stressors (heat, pressure, moisture)

Other top decision drivers across applications are:

Ease of application

Personal history/experience with the bonding solution
ADVANTAGES OF COMPETING SOLUTIONS:

Liquid Adhesives/Pastes

“We get an **instant and robust bond** once the liquid adhesive is put on.”

“I would use liquid adhesive over PSA tape if I want a solution that will **seep into small places, like small spaces or small cracks**.”

“Liquid adhesives have **higher mechanical shock resistance and vibration**, even when exposed to harsh environmental circumstances for a long time.”

“We cannot rely on tape because it **doesn’t work on uneven surfaces**, so in those cases we go for liquid adhesive.”

Mechanical Fasteners

“To get a **permanent bond**, mechanical fasteners are the best option rather than using pressure sensitive tape.”

“It’s a **more secure** means, and it may be bulkier and more time consuming but it’s worth it in the end.”

“The reliability of mechanical fasteners helps us to **attach non-similar surfaces rigidly**.”

“I already have the equipment & am more familiar with mechanical fasteners.”
C4. How often do you specify/use the bonding solutions shown below for [APPLICATION] applications in your automotive jobs or projects? (Frequently/Almost always)

SHORTFALLS OF COMPETING SOLUTIONS

**Liquid Adhesives/Pastes**
- Damage to the surface being bonded
- Degrades over time
- Costs
- Messy to apply
- Takes too long to set
- Requires special tools or systems
- Requires training
- Can’t place precisely

**Mechanical Fasteners**
- Heavier/more weight
- Requires special tools or systems
- Costs
- Damage to the surface being bonded
- Can’t withstand environmental stressors
- Can’t place precisely
- Takes too long to apply
The OEM plays a significant role in decision-making throughout the supply chain.

### Influence of the OEM for Bonding Solution
(Final Decision-Maker/Significant Influence)

<table>
<thead>
<tr>
<th>Tier 2/3 (net) (A)</th>
<th>48%</th>
<th>88%</th>
<th>n = 25*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tier 1 (B)</td>
<td>43%</td>
<td>90%</td>
<td>n = 49*</td>
</tr>
<tr>
<td>OEM (C)</td>
<td>69% B</td>
<td>85%</td>
<td>n = 67</td>
</tr>
</tbody>
</table>

### Influence of the OEM for Bonding Product
(Final Decision-Maker/Significant Influence)

<table>
<thead>
<tr>
<th>Tier 2/3 (net) (A)</th>
<th>44%</th>
<th>80%</th>
<th>n = 25*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tier 1 (B)</td>
<td>45%</td>
<td>90%</td>
<td>n = 49*</td>
</tr>
<tr>
<td>OEM (C)</td>
<td>70% B</td>
<td>87%</td>
<td>n = 67</td>
</tr>
</tbody>
</table>

C1. Who influences and is ultimately responsible for the final decision of which bonding solution is specified?
C2. Who influences and is ultimately responsible for the final decision of which specific bonding product is specified?

*Caution: Small base size (n<50)
ROLE OF CONVERTERS

Just over 30% of companies in the automotive space are using converters for a majority of their PSA Tape needs, but many decision-makers are unsure of the role converters play.

Percent of PSA Tape That Goes Through a Converter

P13. In your work, what percent of your company’s pressure sensitive adhesive tape goes through a converter?

*Caution: Small base size (n<50)
Converters have influence in the bonding products specified across the supply chain but are more likely to be decision-makers for Tier 2/3 companies.

**Influence of the Converter**
(Final Decision-Maker/Significant Influence)
Total Respondents (n=157)

- **Bonding Solution**
  - Tier 2/3 (net) (A): 20% (n=25*)
  - Tier 1 (B): 8% (n=49*)
  - OEM (C): 6% (n=67)

- **Bonding Product**
  - Tier 2/3 (net) (A): 16% (n=25*)
  - Tier 1 (B): 4% (n=49*)
  - OEM (C): 7% (n=67)

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1. Who influences and is ultimately responsible for the final decision of which bonding solution is specified?
2. Who influences and is ultimately responsible for the final decision of which specific bonding product is specified?

*Caution: Small base size (n<50)
Most express some openness to trying new solutions and are excited for products that will overcome the challenges of current solutions, though receptivity to tapes is softer among OEMs.

### Agreement With Attitudes About PSA Tape

Total Respondents (n=157)

<table>
<thead>
<tr>
<th>Attitude</th>
<th>Strongly agree</th>
<th>Somewhat agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>I'm excited for a new solution that can overcome challenges of existing ones</td>
<td>36%</td>
<td>75%</td>
</tr>
<tr>
<td>I am open to the idea of considering new bonding solutions like tapes</td>
<td>29%</td>
<td>72%</td>
</tr>
<tr>
<td>My management is open to the idea of considering new bonding solutions like tapes</td>
<td>22%</td>
<td>63%</td>
</tr>
<tr>
<td>I can already imagine some strong use-cases for pressure sensitive tape</td>
<td>21%</td>
<td>60%</td>
</tr>
<tr>
<td>It's a new technology, so I'm uncertain how well it will perform long term</td>
<td>19%</td>
<td>51%</td>
</tr>
<tr>
<td>The OEM has a strong bias towards a certain type of pressure sensitive tape</td>
<td>20%</td>
<td>45%</td>
</tr>
<tr>
<td>I need more education to understand how to use it best</td>
<td>14%</td>
<td>44%</td>
</tr>
<tr>
<td>I'm worried about the costs of switching over from my typical bonding solutions</td>
<td>16%</td>
<td>43%</td>
</tr>
</tbody>
</table>

### OEM
- Less open to new bonding solutions
- Less likely to imagine use-cases

### Converters
- Excited for new solutions
- Open to new bonding solutions
- Can already imagine use-cases

### All groups
- Worry about long-term performance
OPPORTUNITIES FOR GROWTH
PSA tapes have room for growth in many applications – particularly sealing, mounting, and identifying/labeling.

Subgroups Most Receptive to Tape for Application

<table>
<thead>
<tr>
<th>Organization type</th>
<th>Project type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identifying/labeling</td>
<td>✔ Tier 1 ✔ Engine projects ✔ Exhaust projects</td>
</tr>
<tr>
<td>Sealing</td>
<td>✔ Tier 2/3 ✔ Exhaust projects</td>
</tr>
<tr>
<td>Mounting</td>
<td>✔ Tier 2/3 ✔ Exhaust projects ✔ Finish &amp; Trim projects</td>
</tr>
</tbody>
</table>

C3. Which of the following types of bonding solution applications do you encounter as part of your work? This could include projects for which you are solely responsible, or projects that involve you working with others on a team.
C4. How often do you specify/use the bonding solutions shown below for [APPLICATION] applications in your automotive jobs or projects?
P1. How suitable is pressure sensitive adhesive tape for each of the following types of applications?
SUITABILITY OF PSA TAPE

Tandem usage of PSA tapes consistently has greater receptivity than the usage of PSA tapes to completely replace another solution in a current application.

Suitability of PSA Tape Products (Extremely/Very Suitable)

Total Respondents (n=157)

<table>
<thead>
<tr>
<th>Usage Type</th>
<th>Extremely suitable</th>
<th>Very suitable</th>
</tr>
</thead>
<tbody>
<tr>
<td>To be used in tandem with mechanical fasteners for extra support or cost</td>
<td>24%</td>
<td>66%</td>
</tr>
<tr>
<td>To be used in tandem with mechanical fasteners for additional performance</td>
<td>24%</td>
<td>58%</td>
</tr>
<tr>
<td>To be used in tandem with liquid adhesives/pastes for extra support or</td>
<td>19%</td>
<td>54%</td>
</tr>
<tr>
<td>cost savings</td>
<td></td>
<td></td>
</tr>
<tr>
<td>As a replacement for liquid adhesives/pastes</td>
<td>20%</td>
<td>52%</td>
</tr>
<tr>
<td>As a replacement for mechanical fasteners</td>
<td>18%</td>
<td>43%</td>
</tr>
</tbody>
</table>

Subgroups Most Receptive to Tape for Usage Type

<table>
<thead>
<tr>
<th>Organization type</th>
<th>Project type</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Tire 1</td>
</tr>
<tr>
<td></td>
<td>Electrical</td>
</tr>
<tr>
<td></td>
<td>Exhaust projects</td>
</tr>
<tr>
<td></td>
<td>Tier 1, 2/3</td>
</tr>
<tr>
<td></td>
<td>Exhaust projects</td>
</tr>
<tr>
<td></td>
<td>OEM</td>
</tr>
<tr>
<td></td>
<td>Exhaust projects</td>
</tr>
<tr>
<td></td>
<td>Converters</td>
</tr>
<tr>
<td></td>
<td>Electrical</td>
</tr>
<tr>
<td></td>
<td>projects</td>
</tr>
<tr>
<td></td>
<td>Converters</td>
</tr>
<tr>
<td></td>
<td>Exhaust projects</td>
</tr>
</tbody>
</table>

P2. How suitable would pressure sensitive adhesive tape products be ...?
**Top Barriers Overall**

1. Resistance to moisture
2. Resistance to temperatures
3. Concern about bond strength
4. Regulatory requirements
5. Durability concerns

**Potential Barriers By Subgroup**

<table>
<thead>
<tr>
<th>Tier 2/3 (net)</th>
<th>Tier 1</th>
<th>OEM</th>
<th>Converter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moisture conditions</td>
<td>Lack of personal experience with PSA Tape</td>
<td>Initial outlay costs</td>
<td>Doesn’t meet organizational standards</td>
</tr>
<tr>
<td>Temperature extremes</td>
<td>Lack necessary equipment/transferability</td>
<td>Need training</td>
<td></td>
</tr>
<tr>
<td>Bond strength</td>
<td></td>
<td>Not sure how to use it</td>
<td></td>
</tr>
<tr>
<td>Product/materials costs</td>
<td></td>
<td>Working with converter</td>
<td></td>
</tr>
</tbody>
</table>
CHALLENGES TO CONVERTING PSA TAPE

Converters (n=10)

Challenges when converting PSA in the automotive industry are...

#1 Not enough research on durability

#2 Concerns about strength used in isolation

#3 Ability to withstand environmental stressors

There isn’t enough research on long term effects. I feel like there will be a lot of issues leading to mistrust to engineers who immediately adopt the idea of using adhesive tape ... not knowing long term how the tape will still hold up.

To use PSA in automotive industry it should be durable enough to withstand extreme pressure. PSA tapes can be only used where the surface is dry, but in our case the majority of mechanical parts are lubricated.
Those in the auto vertical often find themselves in need of solutions that offer greater durability, are faster/easier to apply and can better withstand environmental conditions.

Unmet Bonding Solution Needs

Total Respondents (n=157)

- Has greater durability: 62%
- Is faster to apply/set: 58%
- Better withstands temperature extremes: 55%
- Better withstands moisture: 54%
- Is easier to apply: 54%
- Has less cost associated with material: 52%
- Provides additional benefits when used in conjunction with another bonding solution: 52%
- Is less messy to apply: 49%
- Would provide additional bond strength used in conjunction with another bonding solution: 49%
- Has less cost associated with installation: 47%
- Allows for more precise placement: 46%
- Is repositionable or allows you to disassemble when needed: 43%
- Offers better stress distribution: 43%
- Works better with modern synthetic materials: 42%
- Requires fewer tools to apply: 40%
- Is lighter/adds less weight: 39%
- Is more aesthetically appealing/Less noticeable: 39%
- Would provide a temporary bond as an assembly aid during a project: 39%
- Requires less training to use: 35%
- Is less hazardous: 31%

*Caution: Small base size (n<50)
KS: Which of the following bonding solution characteristics do you look for when working on automotive jobs or projects?
Greater use of advanced materials, electric motors, and green vehicles are expected to have significant impact on the selection of bonding solutions for automotive applications in the future.
Pressure sensitive adhesive tapes are growing in use in the automotive industry. I think the best opportunity for using these tapes is…

**Selected Verbatims**

“in concert with epoxy to create a super strong hold.”

“to play a crucial role minimizing the vibration that is generated from different mechanical components.”

“with the corrosion resistance ability, pressure adhesive tapes can be used in every part of cars, except some chassis joints.”

“for use as pads between bolts and the parts, as a cushion.”

“in sealing of displays and other electronics.”

“instead of welding two substrates, PSA tapes can be used for better cosmetic effect without ruining the color of the surface.”

“in lieu of fasteners when safety and reliability are less critical.”

“for wrapping of cable, I think pressure adhesive tapes fit perfectly.”

“to join trim of the cars, pressure adhesive tapes is a great option.”

“applying to the door edges to help in keeping the door airtight while AC or heater is on in the car.”
TACTICAL CONSIDERATIONS FOR GROWTH
INFO SOURCES FOR NEW BONDING PRODUCTS/ APPLICATIONS

Common Sources of Information About New Bonding Products (Frequently)

#1 Vendors/Suppliers

#2 Bonding product manufacturers

#3 Information provided by your employer

#4 Colleagues/Co-workers

#5 Trade/Industry publications or websites
### IMPACT OF INFORMATION SOURCES

Information received from vendors/suppliers, manufacturers, employers, and colleagues is considered to be most impactful in garnering consideration of PSA tape for new applications.

<table>
<thead>
<tr>
<th>Frequency of Receiving Information from Source</th>
<th>Impact of Information Sources</th>
</tr>
</thead>
</table>
| Information received from vendors/suppliers, manufacturers, employers, and colleagues is considered to be most impactful in garnering consideration of PSA tape for new applications. | Vendors/Suppliers

**Information provided by your employer**

**Bonding product manufacturers**

**Colleagues/Co-workers**

**End users of the bonding products**

**Trainings offered by your employer**

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11. How often do you typically receive information about new bonding products and/or new applications for existing bonding solutions from each of the following sources?

12. How impactful is the information you receive from each of the following sources in changing the bonding solutions you consider or specify as part of your work in automotive jobs or projects?
I3. What types of information have you seen in the past 12 months about new bonding solutions or usage of existing bonding solutions in new applications?

I4. How influential are each of these types of information in what bonding solutions you consider for specific applications in your automotive jobs or projects?

Advertisements and marketing materials from bonding product manufacturers

Scientific tests and supplier/vendor recommendations are the most compelling to motivate specifiers to consider a bonding solution, the latter is much more common.
SUMMARY OF FINDINGS

- The OEM has significant influence on bonding decisions in the automotive vertical, though suppliers/vendors are also influential information sources.

- Converters are also influential but perceive similar barriers as specifiers in the vertical.

- Sealing and mounting are two frequent application categories where PSA tapes are found suitable, but underused.

- As seen in other industries, automotive specifiers are more open to using tapes in tandem with, rather than as a replacement for, other solutions.

- Key barriers to address include concerns about bond strength, durability, ability to withstand environmental stressors and adherence to regulatory standards. Ease & speed of application are also key decision-drivers in the vertical.

- The usage of newer, advanced materials is the top automotive trend expected to influence bonding solution selection in the automotive vertical in the future.
OVERALL OPPORTUNITIES

- OEMs are a particularly important target for targeted outreach and education given their influence on decision-making throughout the supply chain.

- There is opportunity to further arm Converters with details (i.e., proof points and potential applications for tape) to increase their confidence in sharing this information and recommending tapes for new applications to the automotive engineers they work with.

- Partnerships with suppliers and direct messaging from manufacturers highlighting novel products or applications can also play a key role in driving consideration of a new solution or existing solutions for new applications.

- Focused product innovation may be required to address unique application needs and environmental condition within the vertical.
Q&A ON FINDINGS