

Adhesives in Automotive Interiors: Versatile & Economic

Adhesive & Sealants Council.
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THE CHEMQUEST GROUP, INC.

Profile and Dynamics

Interior Applications Utilize Many Adhesive Types

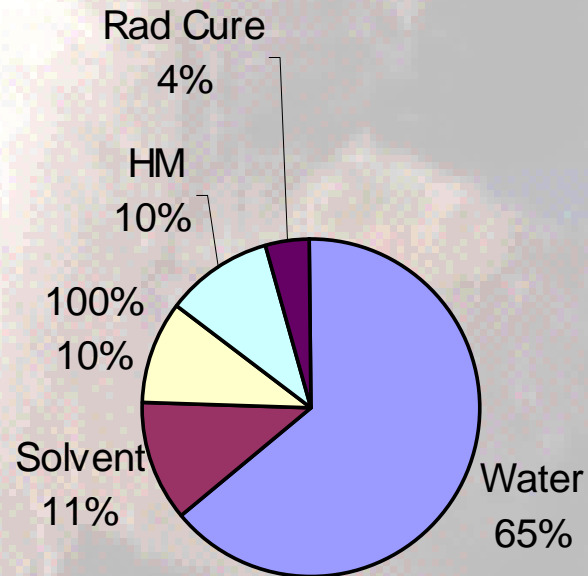
- Hot Melts
- Water Based
- 100 % Reactive
- Solvent Based
- Pressure Sensitive Adhesives & Non-PSA

***Close to 100 Million
Dry Pounds in 2003
with almost 7% AGR
Predicted***

Adhesives for Automotive Interiors

- Interior Applications by Formulative Technology

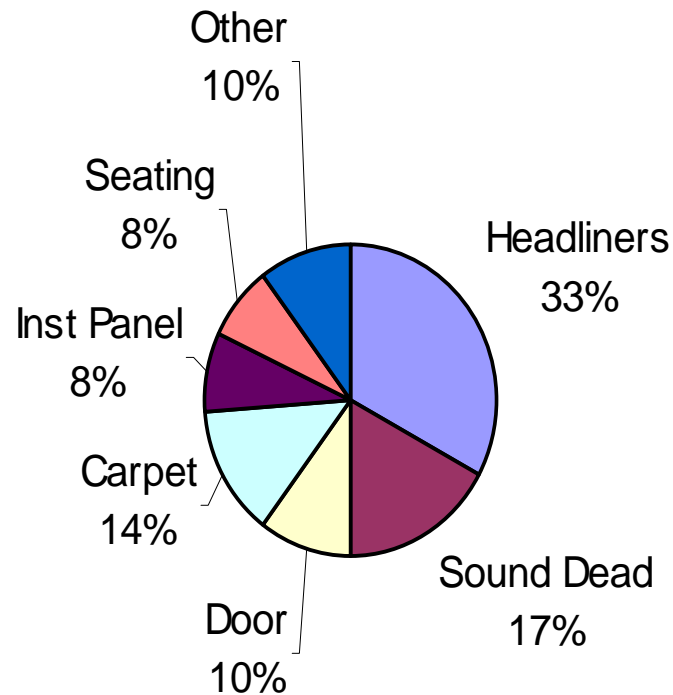
Formulative Technologies, US



Adhesives for Automotive Interiors

- Interior Applications

Auto Interior Adhesive Consumption, US



Adhesives for Automotive Interiors

Why Interiors?

Profile and Dynamics

- Design Flexibility
- Even Distribution of Bond Stresses
- Join Dissimilar Substrates
- Fill Gaps
- Noise / Vibration
- Weight Reduction
- Invisible Bonding
- Corrosion Protection
- Reduced Manufacturing Costs
- Bond Strength
- Potential for Dual Functionality
- Ability to Fit into tight spaces

Profile and Dynamics

Design Flexibility

- Interiors have become “living rooms”
- Interior Designs Change Frequently
- Increasing use of electronics/entertainment in the cockpit
- Complex Climate Control
- Need for Quiet Ride
- Plastics use continues to increase
- Drive toward lower weight caused by CAFÉ Standards

Profile and Dynamics

Even Distribution of Bond Stress

- Even distribution offers reliability and consistency not possible with mechanical fasteners
- Improved aesthetics
- Helps weight reduction goals

Profile and Dynamics

Join Dissimilar Substrates

- Flexibility of interior design requires broad options in material selections for designers
- Increasing use of engineering thermoplastics
- Increasing need for bonding/joining dissimilar plastics, metals and textiles

Automotive Interior Adhesives

Profile and Dynamics

Fill Gaps

- Process variability
- Manufacturing Ease
- Noise / Vibration

Automotive Interior Adhesives

Profile and Dynamics

Noise / Vibration

- Interiors have become “living rooms”
- Increasing use of electronics in the cockpit
- Need for Quiet Ride
- 24/48 Volt Systems
- Drive toward lower weight caused by CAFÉ Standards

Profile and Dynamics

Weight Reduction

- Fewer metal components and fewer frame structures
- Modular design
- Interior Designs Change Frequently
- Increasing use of electronics in the cockpit
- Plastics use continues to increase
- Drive toward lower weight caused by CAFÉ Standards

Profile and Dynamics

Invisible Bonding

- Interiors have become “living rooms” – aesthetics matter
- Interior Designs Change Frequently
- Plastics use continues to increase
- Modular Design requires ease of assembly and repair

Automotive Interior Adhesives

Profile and Dynamics

Corrosion Resistance

- Sealed Cockpit desirable
- Interior Designs Change Frequently
- Increasing use of electronics in the cockpit

Automotive Interior Adhesives

Profile and Dynamics

Reduced Manufacturing Costs

- Modular design and assembly
- Faster Faster Faster
- More complex interiors
- Must be right the first time
- Automation a Critical ***must***
- Focus on Total Applied Cost

Profile and Dynamics

Bond Strength

- Adhesives offer best alternative in most instances, but disassembly is often a challenge
- Interior Designs Change Frequently
- Consumer perceptions of quality can not accept failures
- Dissimilar Substrates
- Plastics use continues to increase

Automotive Interior Adhesives

Profile and Dynamics

Potential for Dual Functionality

- Bond & Seal

Profile and Dynamics

Ability to fit into tight spaces

- Rapid manufacturing requires ease of assembly where other fastening methods often can not be practical due to confined space
- Adhesives offer compact design and ease of manufacture while maintaining minimum weight goals

Profile and Dynamics

Challenges

- 24 & 48 Volt Systems
- Increasing Assembly Speeds – time for drying or curing being pushed to limits
- Globalization
- Cost Pressures
- Increasing usage of Polyolefins (low energy surfaces)
- Rapid Design and Process Changes
- CAFÉ Standards extending to light truck?

Adhesives for Automotive Interiors

Summary

- Adhesives for Auto Interior approach 100 Million Pounds in US
- Attractive 6% Annual Volume Growth Predicted
- Global Business
- Adhesives offer attractive benefits for design & process engineers
- Disassembly & Repair will remain a challenge to continued growth
- Trend toward faster assembly will continue requiring faster drying & curing adhesive technologies
- Pressure Sensitive Products becoming increasingly attractive
- New Technologies finding ready applications within Interior markets – reactive hot melts, “structural” PS materials, etc.

Thank You

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