



**ADHESIVES AND
SEALANTS**

Innovation

Adhesives and Flexible Packaging

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Adhesives and Sealants
Rohm and Haas Company

CMM International – Chicago 2003

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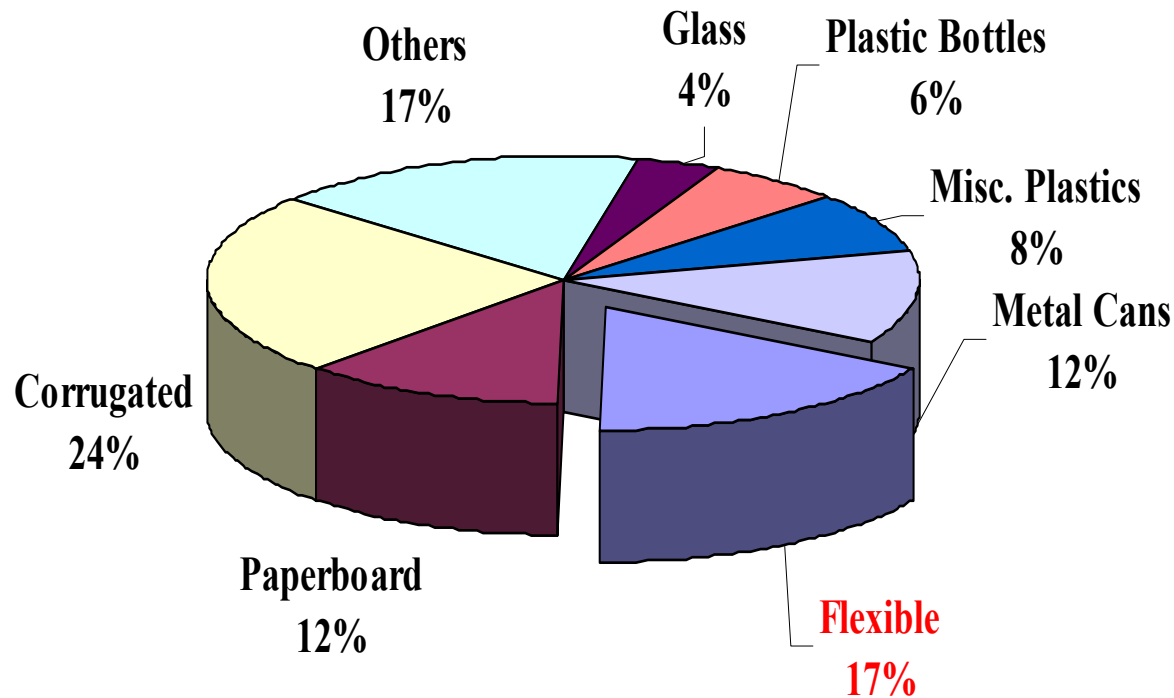


Agenda

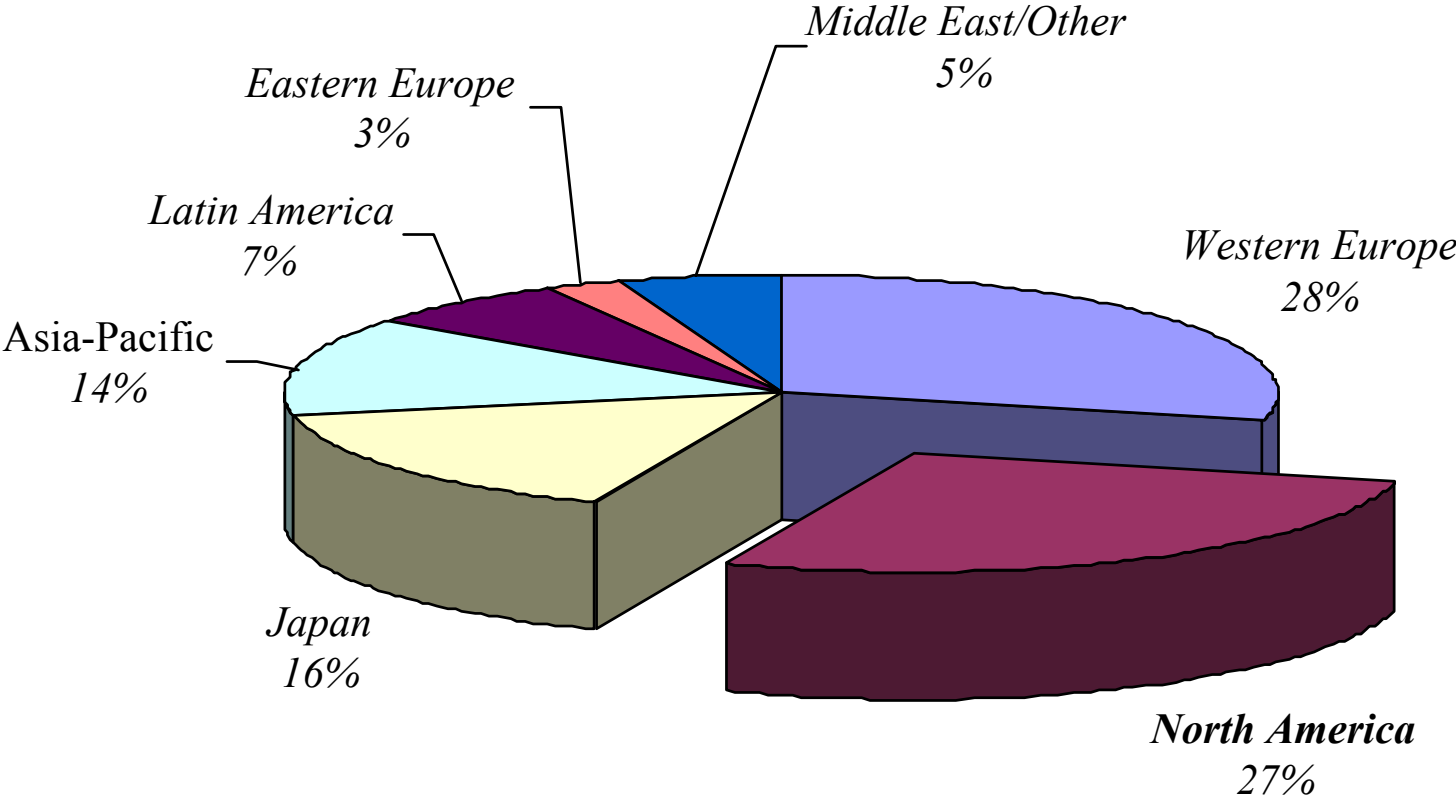
- Flexible Packaging Market – Brief Overview
- Drivers in Flexible Packaging
- Packaging and Adhesive Innovation
- Adhesive and coating trends
- New technologies
- Adhesive and Sealant Council



Flexible Has Become a Leader in Packaging

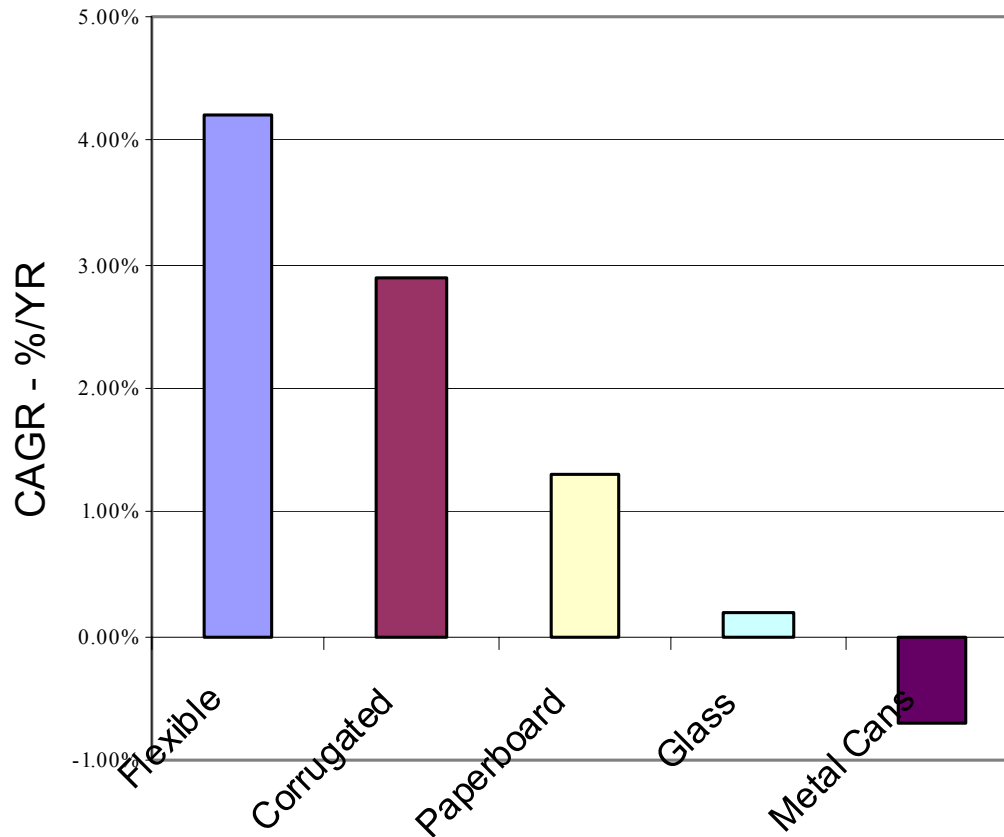


Flexible Packaging - \$70 Billion



Growth Versus Competitive Systems

Packaging Segment Growth - 1996-2001



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Drivers for Innovation in Packaging Material Remain Unchanged

- Demographic change
- Advances in Material Science
- Economies of scale
- Industry Consolidation
- Geographic Expansion



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Packaging Innovation Today

“ Two forces play key roles in determining packaging materials suppliers’ financial performance...pressure from food producers to **reduce the cost-in-use** for packaging materials...Food producer’s desire to **enhance their product’s consumer appeal** through attractive packaging with better properties, increasing their demand for new materials sold at higher prices”

“ Improvements and innovations...have created opportunities for flexible packaging **at the expense of rigid packaging**. This development has been the most important factor driving growth and profitability in the industry. ”

Robert N. Castellano

Flexible Packaging: Innovation Continues to Drive Growth (1998)



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Packaging Innovation Today

“ Efforts to develop new and improved packaging in the converted flexible packaging industry are ongoing, with much effort focusing on **lowering production costs**, down-gauging and light-weighting, improving strength and barrier properties, enhancing aesthetics..., and improving packaging’s environmental profile... ”

The Freedonia Group

Converted Flexible Packaging to 2005 (2001)

“ I believe the stand-up pouch for beverages is the top flex-pack growth market...The metal can is an outdated package for a beverage and will face increasing competition...**less expensive retort stock and improved dispensing technology** will penetrate traditional packaging . ”

Stanley Sacharow, The Packaging Group

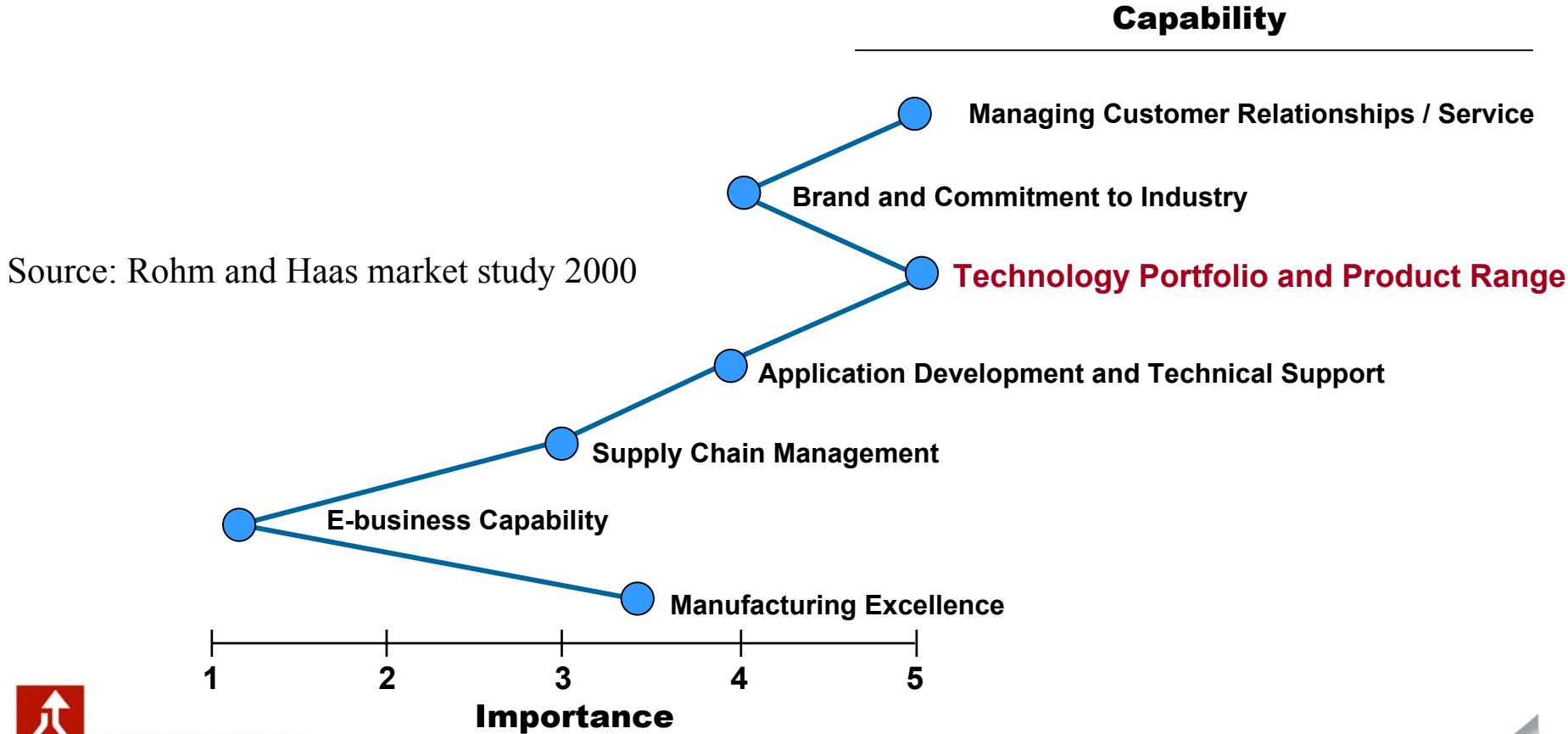


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What is Required to Service Flexible Packaging Converters



Source: Rohm and Haas market study 2000



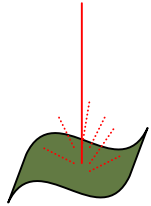
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Sources: A.T. Kearney analysis

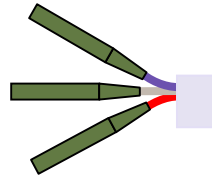
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A Complete Product Range



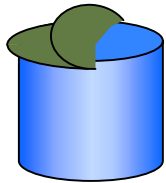
Barrier Coatings



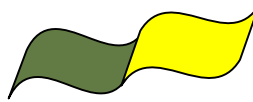
Extrudable Resins



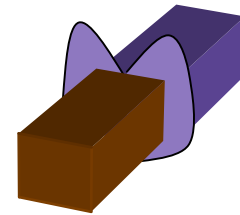
Laminating Adhesives



Heat Seals



Coatings



Cold Seals

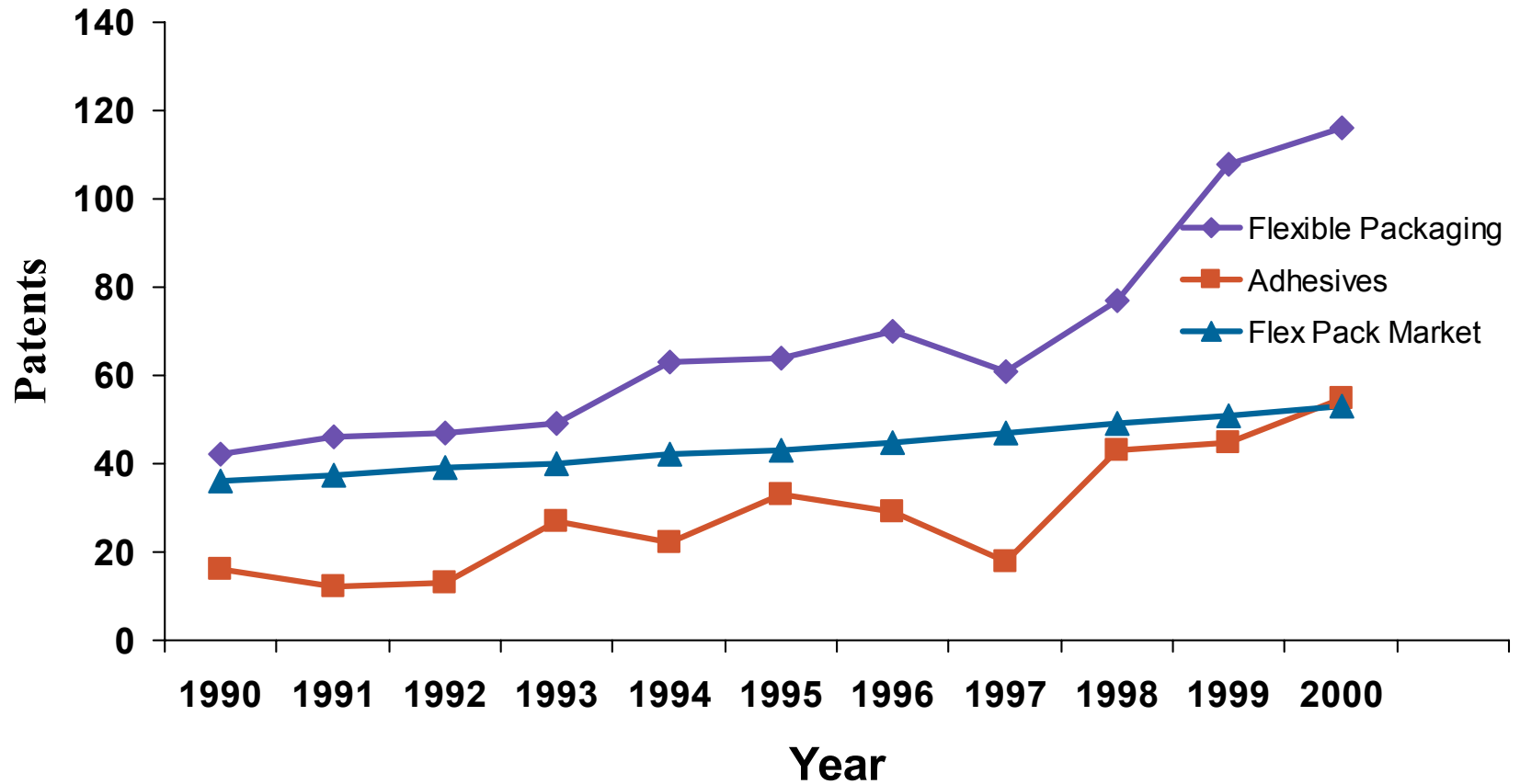


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Packaging and Adhesive Technology Change



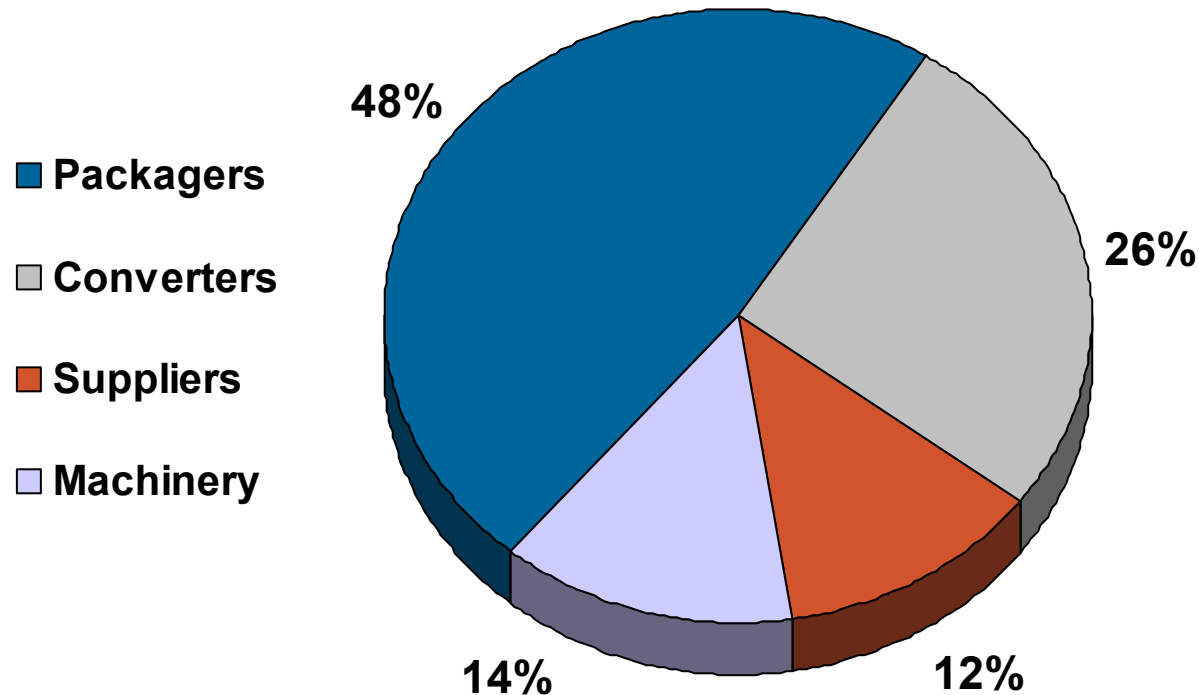
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Who is driving Innovation in Packaging?

Flex Pack Patents by Assignee, 1990 to 2001

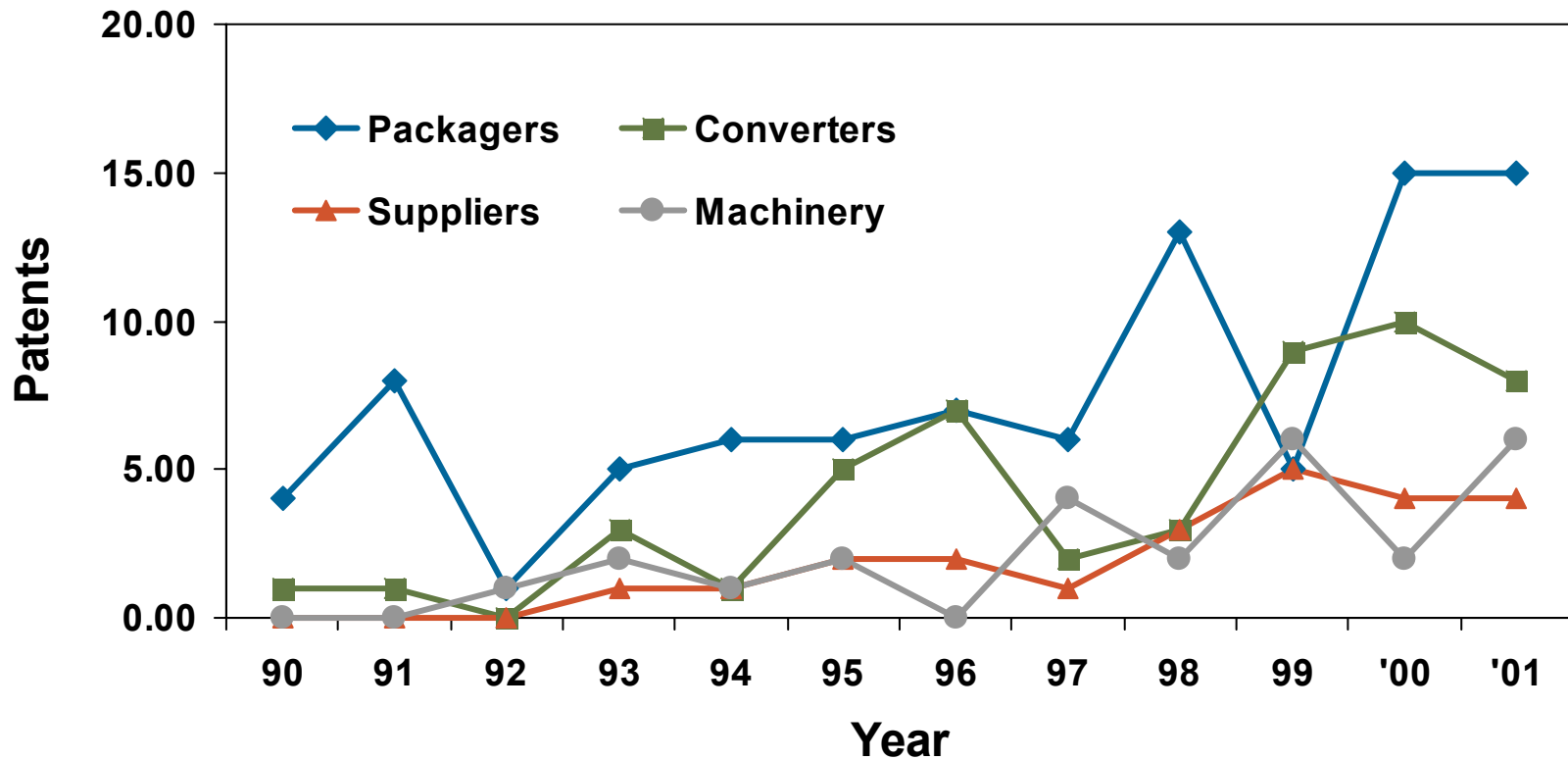


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Innovation is Increasing Throughout the Value Chain



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Key areas of Flexible Packaging Innovation

Packagers:

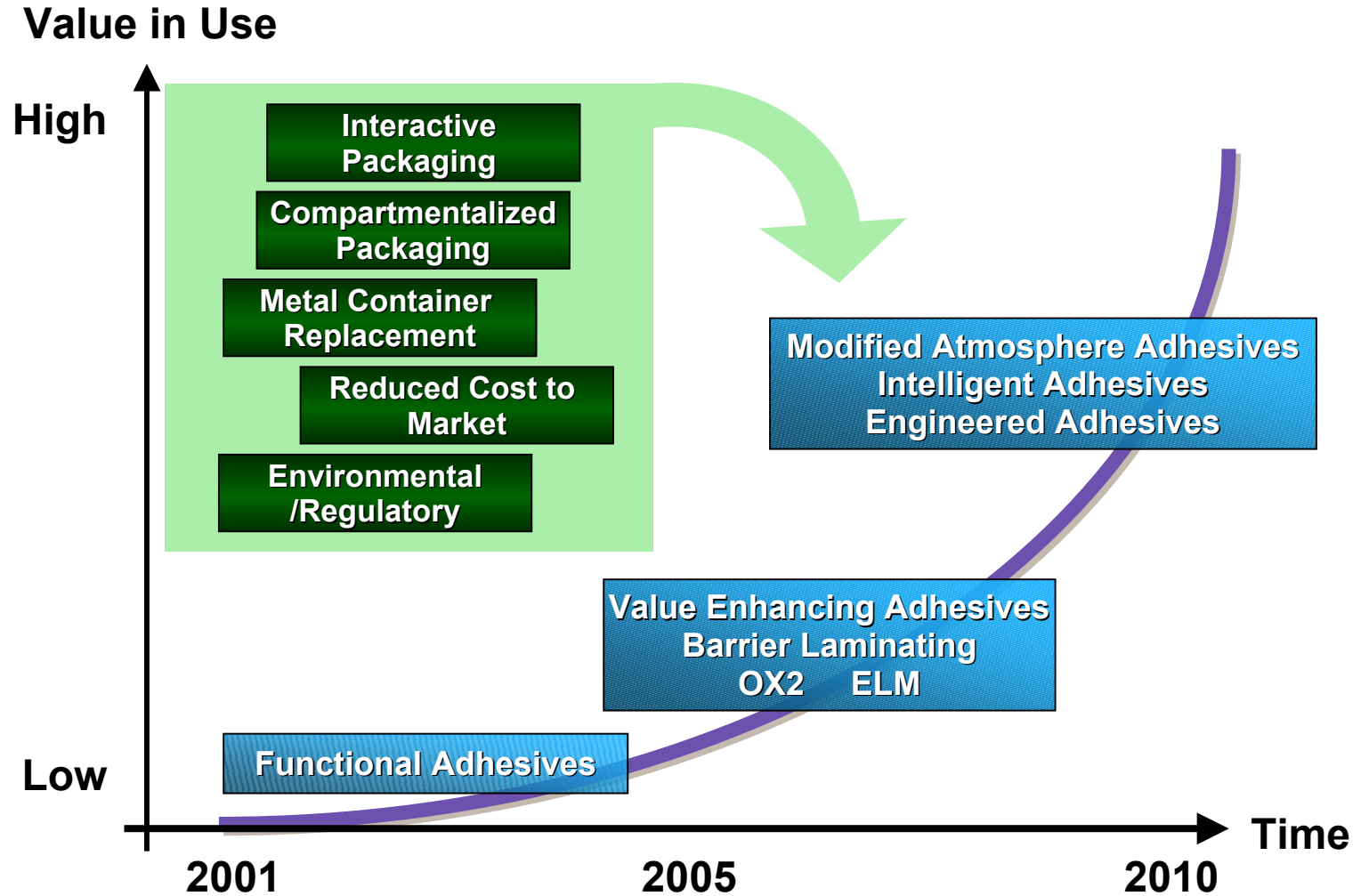
- Tamper evidence
- Resealability / reclosability
- Easy-open
- Peel / reseal
- Compartmented Packaging
- Vacuum packaging
- Oxygen Scavenging
- CAP / MAP

Converters / Suppliers:

- Easy open packaging
- Resealable packaging
- Vacuum packaging
- Barrier packaging
- Retort Packaging
- Oxygen scavenging
- Stand up pouches
- Compartmentalized packaging



Technology Roadmap Adhesives





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Where Are We Today?

Flexible Laminating Trends

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Laminating/Coating Trends

- ***Solvent-Free Growth***

- North American Growth Phase Beginning
- Low Capital Expenditure – No Drying
- No VOC Issues
- Productivity
- Application Capability Grows Daily
- Fast Cure Technologies will Evolve.
 - Rad-Cure
 - Alternate Technologies



Laminating/Coating Trends

- ***Waterbased Developments***

- Transition from Solvent Based on Existing Equipment
- Cost Effective
- New Acrylic Chemistries – Improved Performance
- Ready-to-use Products
- Slit in-line



Laminating/Coating Trends

- ***Solvent Based Evolution***
 - Urethane Technology Continues to Lead in Performance
 - Broadened Performance
 - Coreactant Combinations
 - Lower Migrating Chemistries
 - Reduced VOC concerns
 - High Running Solids Systems
 - Friendlier Solvents



Laminating and Coating Trends

- *Radiation Cure – An Evolving Technology*
 - **Adhesives**
 - Work in Process
 - Ship on Demand
 - Evolving Technology
 - **Topcoats**
 - Elimination of Film Layer
 - Work In Process
 - Ship on Demand
 - Proven on Cold Seal Confectionary Packaging



Cutting Edge Adhesive Developments

- Low Monomer Solvent-Free (ELM)
- Economical Retort Technologies
- Non Isocyanate Systems
- Break-Through Water-based Technology
- Novel Barrier Technologies
- Energy Cure and other “Fast Cure” Technologies





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THE ADHESIVE AND SEALANT COUNCIL, INC
Founded in 1958

***An organization bound by the collective efforts
of its members . . .***

- **To improve the industry operating environment**
- **To strengthen member companies**

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THE ADHESIVE AND SEALANT COUNCIL, INC

Strategic Goals

- **Provide training, information, and interaction for members**
- **Offer educational programs that communicate the advantages of adhesives and sealants over other types of fasteners**
- **Represent the industry in regulatory and government affairs**





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Thank You

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