



**ADHESIVES AND  
SEALANTS**

# **Advances In Packaging: Made Possible With Adhesives**

**Flexible Packaging Seminar  
Nancy Smith**

power@work



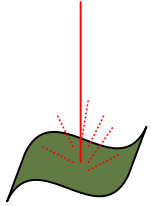
# **Agenda**

- **Adhesive uses in packaging**
- **Drivers for packaging innovation**
- **Trends and developments in adhesive innovation**
- **Examples of package/adhesive innovation**

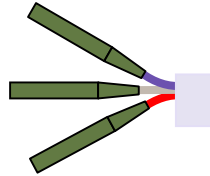
# **Adhesive Uses In Packaging**

- **Flexible Packaging : laminating, heat seal, cold seal, tie resins**
- **Rigid Packaging: corrugating, box closing, carton adhesives, ties, sealants**
- **Labels**

# Flexible Packaging Adhesives and Coatings



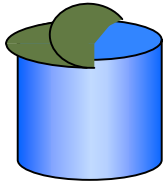
*Barrier Coatings*



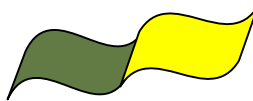
*Extrudable Resins*



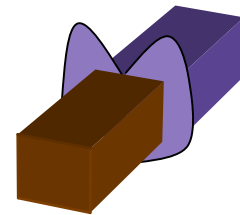
*Laminating Adhesives*



*Heat Seals*



*Coatings*



*Cold Seals*

# 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)

# 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

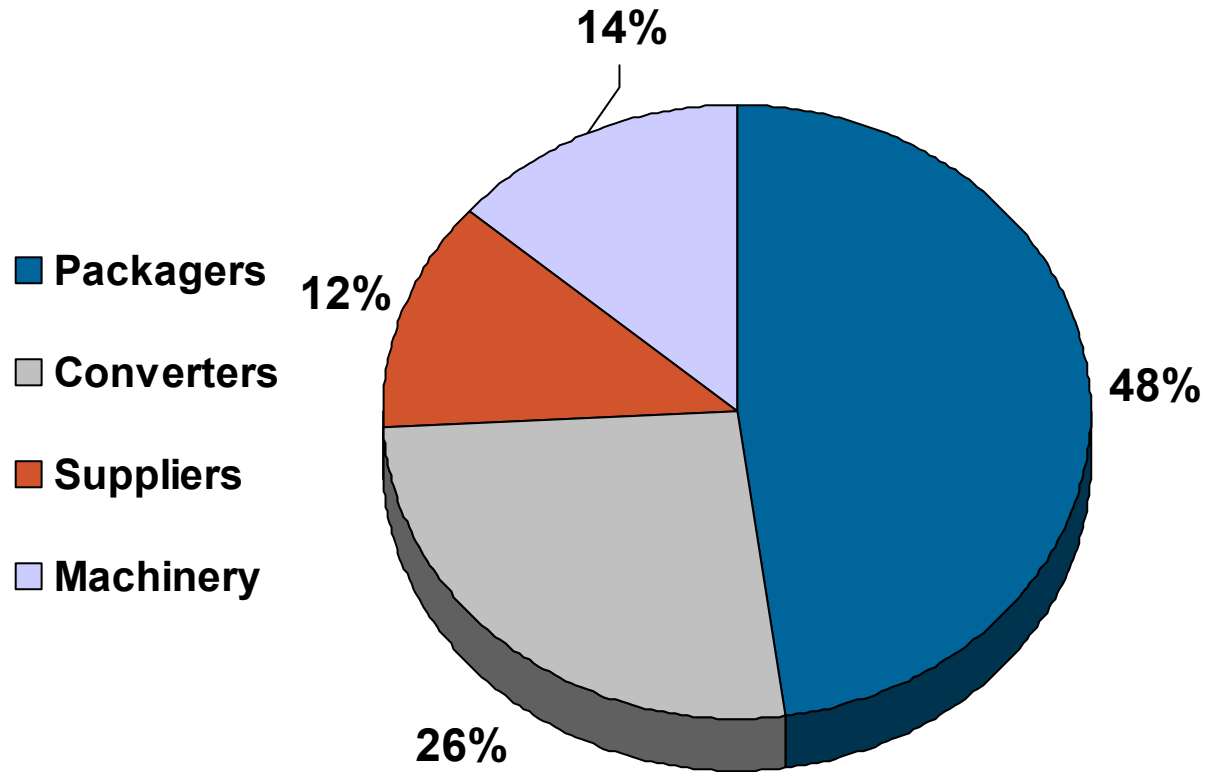
Converted Flexible Packaging to 2005 (2001)

“ 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 . ”

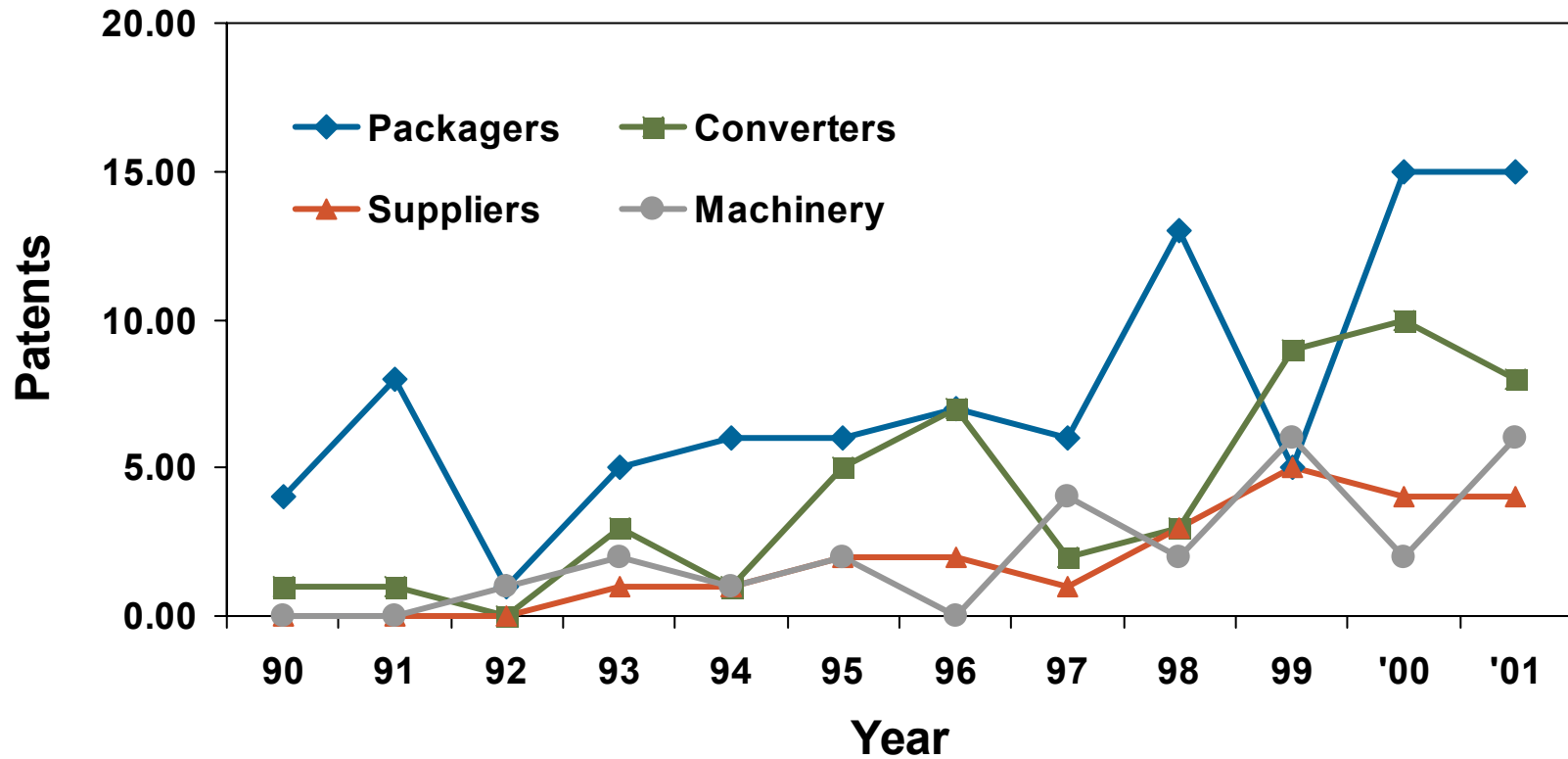
Stanley Sacharow, The Packaging Group

# Who is driving Innovation in Packaging?

## *Flex Pack Patents by Assignee, 1990 to 2001*



# Innovation is Increasing Throughout the Value Chain



# **Key areas of Flexible Packaging Innovation**

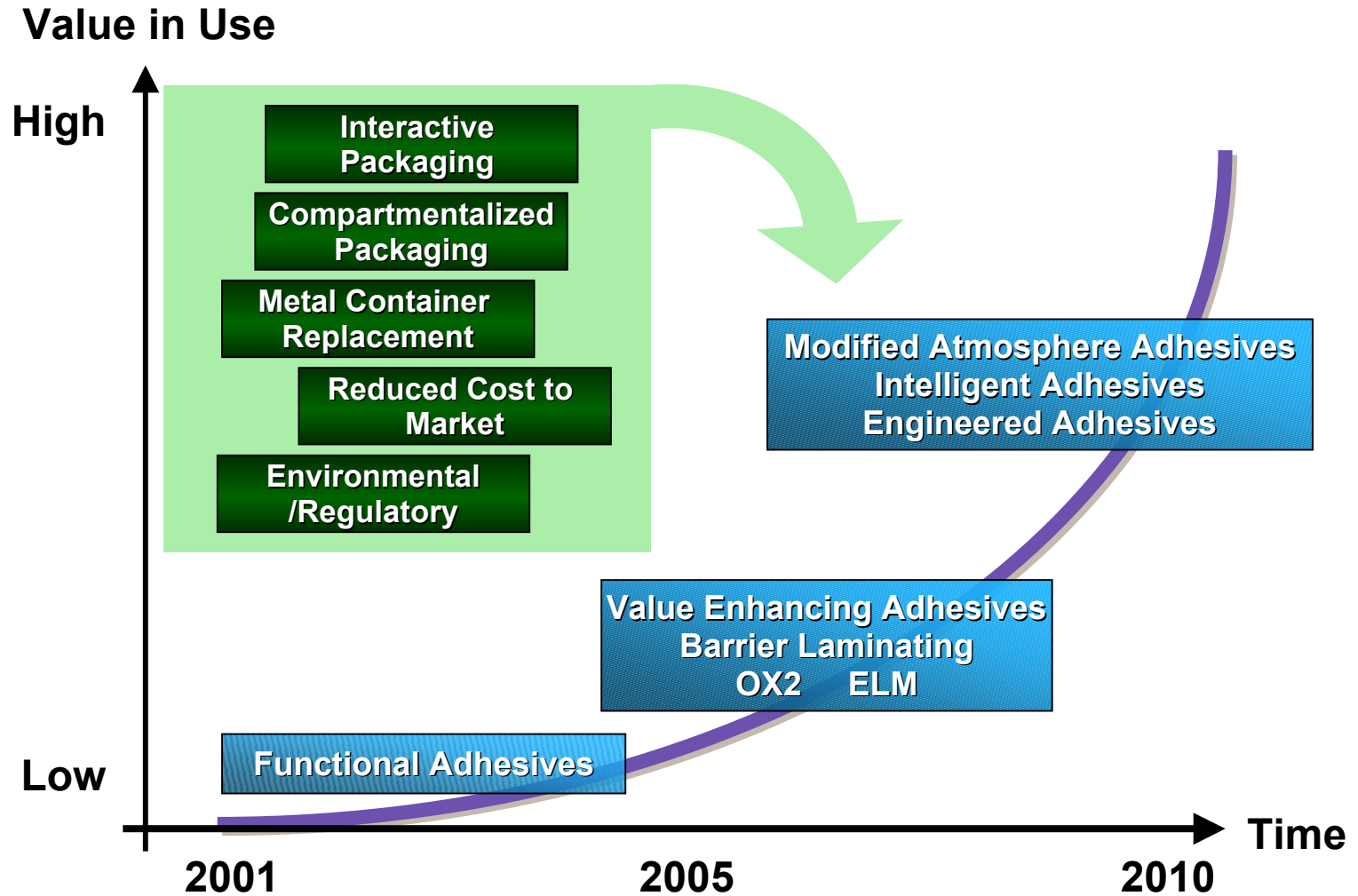
## **Packagers:**

- **Tamper evidence**
- **Easy-open**
- **Peel / reseal**
- **Compartmented Packaging**
- **Vacuum packaging**
- **Oxygen Scavanging**
- **CAP / MAP**

## **Converters / Suppliers:**

- **Easy open packaging**
- **Resealable packaging**
- **Vacuum packaging**
- **Barrier packaging**
- **Retort Packaging**
- **Oxygen scavanging**
- **Stand up pouches**

# Technology Roadmap Adhesives



**Where Are We Today?**

**Flexible Laminating Trends**

# 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

# **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 Technologies**

# **Package Design Considerations**

- **Aesthetics and shelf appeal**
- **Ease of use by consumer**
- **Product to be packed**
- **Environmental and exposure criteria**
- **Shelf life**
- **Cost**
- **Packaging equipment compatibility**

# **How Does Adhesive Impact Design?**

- **2/3 of buying decisions made at point of sale**
- **Films used and lamination quality impact graphics**
- **Films used and lamination quality are adhesive dependent.**

## **Adhesives are formulated to:**

- **Bond unlike materials together**
- **Have required heat and chemical resistance**
- **Minimize foam (bubbles and blisters)**
- **Dry clear**
- **Provide smooth appearance**

## **Proper Adhesive Choice:**

- **Can provide barrier or allow oxygen to enter**
- **Performs in end use environment (examples: soap bottle labels in shower, retort pouch, soil bags with UV exposure)**
- **Withstands product (cleaning wipes)**

# **Examples of Innovation**

# **Examples of Innovation**

- **Recent Flexible Packaging Association Achievement Award Winners**
- **Innovation in convenience, shelf stability, shelf life, recloseability**

# Aseptic Shelf Stable



- Portable
- 12 month shelf life
- Packaging innovation
- Peroxide bath before filling – adhesive withstands

Photo courtesy of Flexible Packaging Association

# Retort Pouch

- **Food quality improved over cans**
- **Inventory pouch only – not bodies, lids, labels**
- **Adhesive crucial – withstands retort and complies to FDA**



Photo courtesy of Flexible Packaging Association

# Retortable



- **Consumer convenience**
- **Adhesive withstands retort of package**
- **Lidding used in microwaveable application**

Photo courtesy of Flexible Packaging Association

# Stand Up Pouch



- **Eye catching**
- **Recloseable**
- **Convenient for selection and handling**
- **Protects contents from freezer environment**

Photo courtesy of Flexible Packaging Association

# Convenience and Product Protection

- Flexible pouch allows user to mix grout
- Clear pouch allows user to see color
- Cap allows for storage stability and dispensing
- Multi layer laminate



Photo courtesy of Flexible Packaging Association

# **Where Do We Go?**

- **Recloseable adhesives – more economical than zipper closures**
- **Intelligent adhesives and packaging**
- **New curing systems – faster, safer**

# **Where Do We Go?**

- **Packaging professionals can help us direct our efforts**
- **As in any endeavor product development takes time**
- **Shorten development time through more direct interaction**

# Summary

- **Adhesives used in all packaging formats**
- **Packagers drive innovation**
- **Trends in adhesive development: solventless, radiation curable, low monomer**
- **Adhesives participate in package innovation and design**

**Thank You**