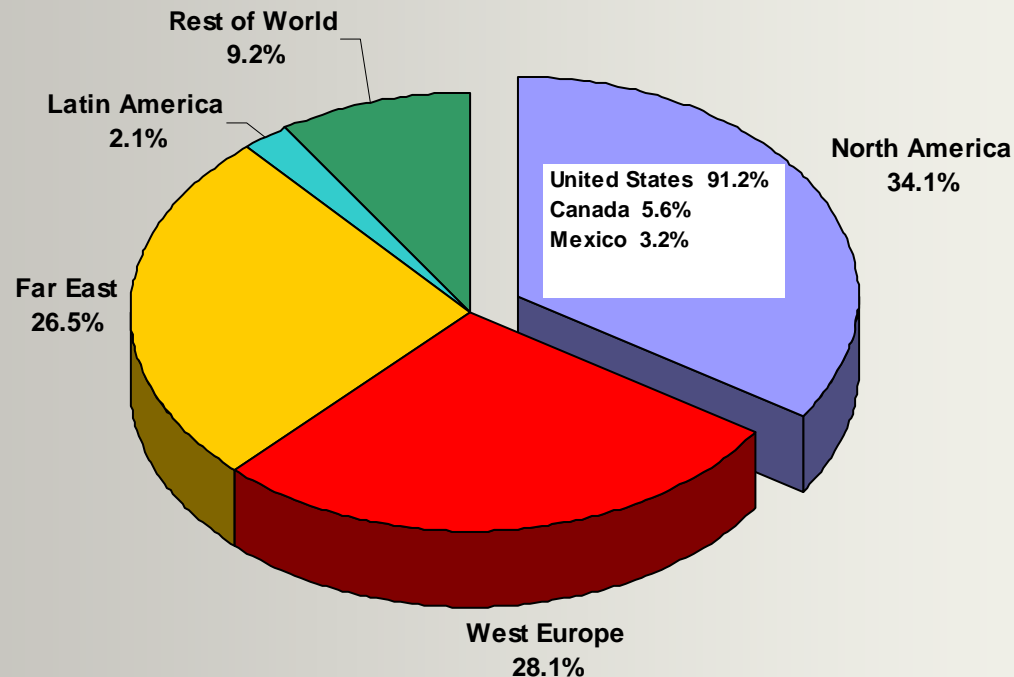


Adhesive Use in Textile Bonding and Laminating

IFAI Expo 2003

**Presented by:
David P. Nick
DPNA International, Inc.**

Global Adhesive Industry 2002

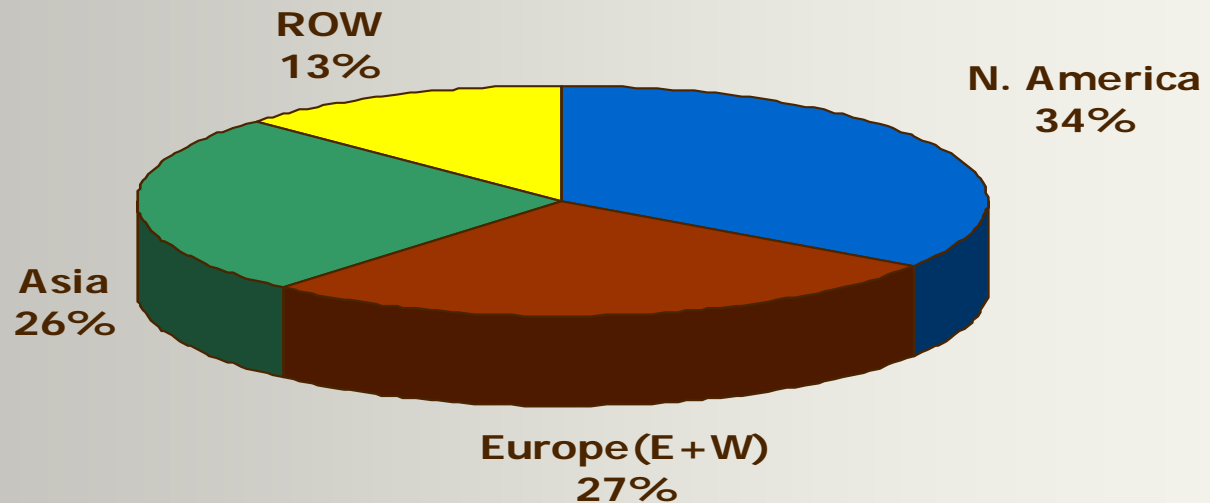


2002 World Total Demand: 20.0 billion pounds ♦ U.S. Dollar Value: \$26.2 billion
Annual Growth Rate 3.0%

Source:
DPNA International, Inc.

World Overview of Textile Bonding Adhesive Usage

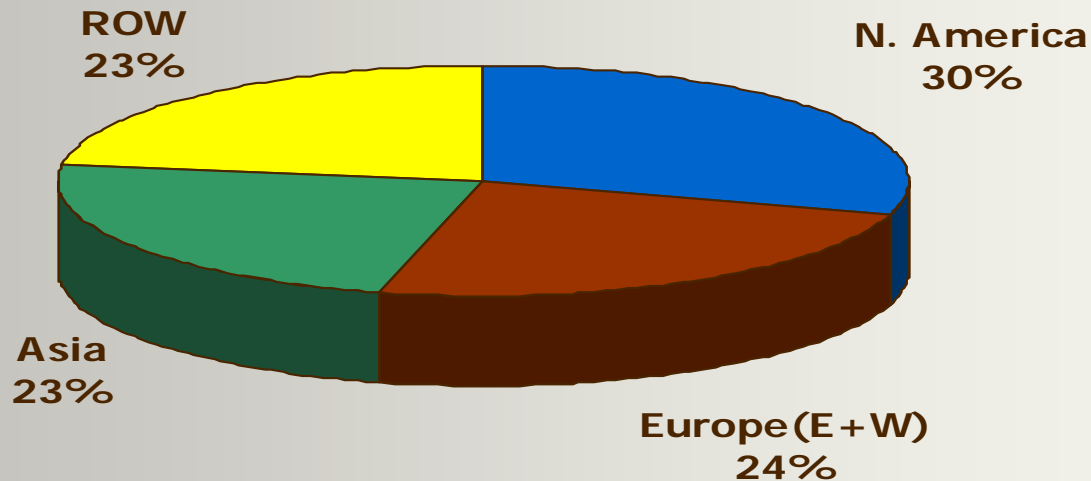
Volume Percent



Total Textile Adhesive Market:
Demand 802 million pounds ♦ Value \$860 million
Annual Growth Rate: '02-'04 2.5%

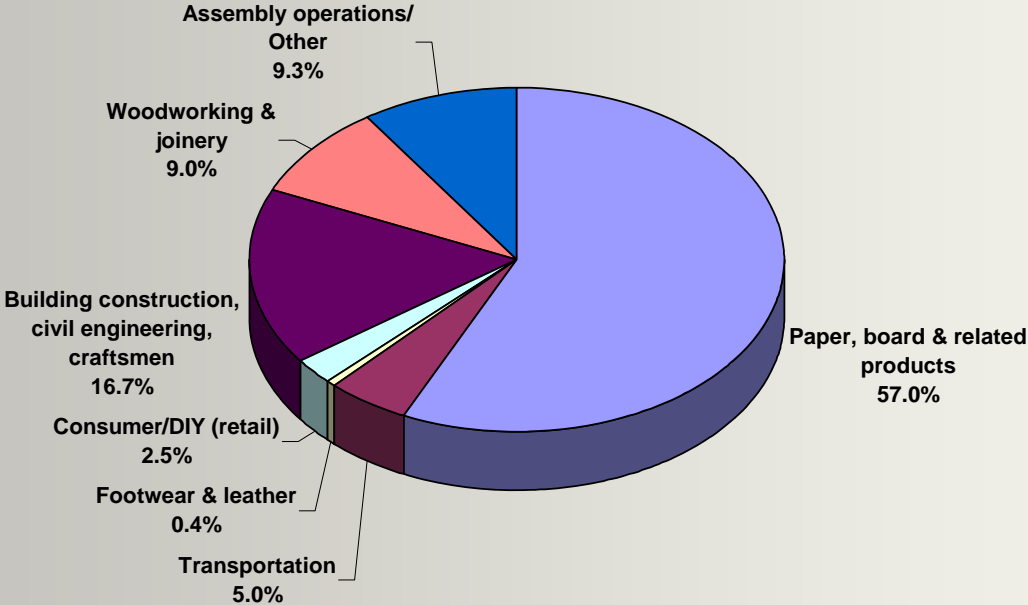
World Overview of Textile Bonding Adhesive Usage

Value \$ Percent



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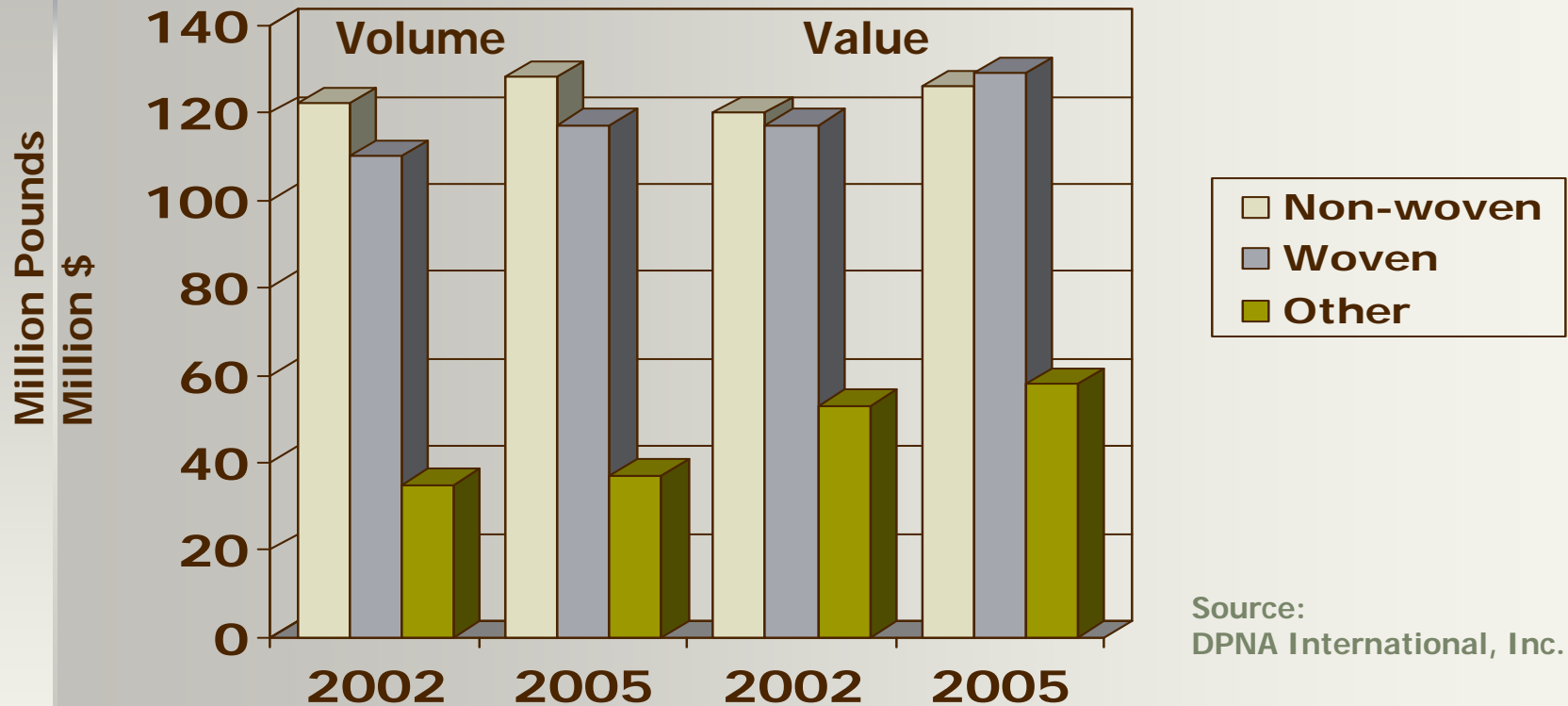
North American Adhesive Demand by Market Segment



U.S. Adhesive Demand: 5707.5 million pounds ♦ U.S. Dollar Value \$7133.7 million ♦ '02-'05 AGR 2.2%

Source:
DPNA International, Inc.

North America Textile Bonding Market by Textile Construction



Source:
DPNA International, Inc.

North America Textile Adhesive Market:
Demand 282 million pounds ♦ Value \$289 million
Growth: 2002-2005 2.7%

Adhesive Technologies

- Water Based
- Solvent Based
- Radiation Curable
- Hot Melt
- Reactive Hot Melt

Adhesive Resin Binders

- Acrylic
- Block copolymers
- Polyamide and co-polyamide
- Polyesters
- Polyurethane
- Rubber (natural and synthetic)
- Silicone
- Vinyls (PVac, EVA)

Adhesive Types

- **Reactive (thermosetting)**
- **Non-reactive (thermoplastic)**
- **Contact cements**
- **Pressure sensitive**

Bonded and Laminated Textile Products – Non-Woven

- Diapers
- Incontinence pads
- Feminine hygiene
- Uniforms
- Filter media
- Apparel
- Geo-textiles

Bonded and Laminated Textile Products - Woven

- **Chemical protective suits**
- **Inflatables**
- **Furniture upholstery**
- **Automotive interiors, airbags**
- **Apparel and accessories**
- **Footwear**
- **Hose**
- **Belting**
- **Medical**
- **Tapes and labels**

Bonded and Laminated Textile Products - Laminates

- Signage
- Membranes
- Tents and awnings
- Tarpaulins
- Supported sheet roofing
- Tank bladders
- Linings

Bonded and Laminated Textile Products – Knits and Other

- Bandages and surgical dressings
- Composites (pipe, aerospace, automotive)
- Sail technology
- Aerospace
- Personal protection (security)
- Specialty industrial tapes

Adhesive Trends

- "B" stage cure adhesives
- Heat sealed multi-layer laminates
- Flame retardant adhesive systems
- Move to water based products away from solvent types
- High strength contact cements
- High temperature resistant adhesives for glass fiber cloth

New Product Trends

- More carbon and Kevlar fiber products
- Flame retardant protective clothing and shelters
- Increased use of multi-layer laminates
- Expanded engineered fabric military applications
- New uses for fabric reinforcement

The Future

- Introduction of nanotechnology
- Engineered constructions
- Reinforced structural tapes
- Expanded uses for textile reinforced technology
- Adhesives will play an increasing role
- New technology for bonded textiles is strongest in the USA followed by Europe
- Commodity bonded textile fabrication is moving to Asia



THE ADHESIVE AND SEALANT COUNCIL, INC

Founded in 1958

Greetings!

ASC is the leading North American trade association representing the Adhesives and Sealants Industry, and represents more than 80% of the merchant and captive business.

125 Member Companies
Headquarters: Bethesda, MD

Thank You

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