

End-Use Applications In Construction

Steve Lontchar
Bostik, Inc.

Originally presented at:
ASC Waterborne Short Course
October 16, 2006

Courtesy

Why Construction?

- 2005 U.S adhesive sales ~ \$2.0 billion (18%)
- 2005 U.S sealant sales ~ \$1.1 billion (48%)
- Key drivers: robust growth in both professional and DIY areas, mechanical fastener complement/replacement

General Industry Needs/Wants

- Usage/application in broad range of environmental conditions (interior/exterior)
- Cost/Performance relationship
- Widespread end-user appeal

Adhesion to broad substrate range!

Solid Wood	Glass	Plaster
Plywood	Porcelain	Vinyl
OSB	Copper	FCB
Brick	Aluminum	Foams
Concrete	Drywall	FRP
Cork	Ceramic	Steel
Rubber	Stone	Plastics

Potential exists for many combinations!

The “Rap” on Water

“Those products don’t work.”

“It takes forever to dry.”

“Are you crazy? I’m not paying that much
– it’s waterbased!!”

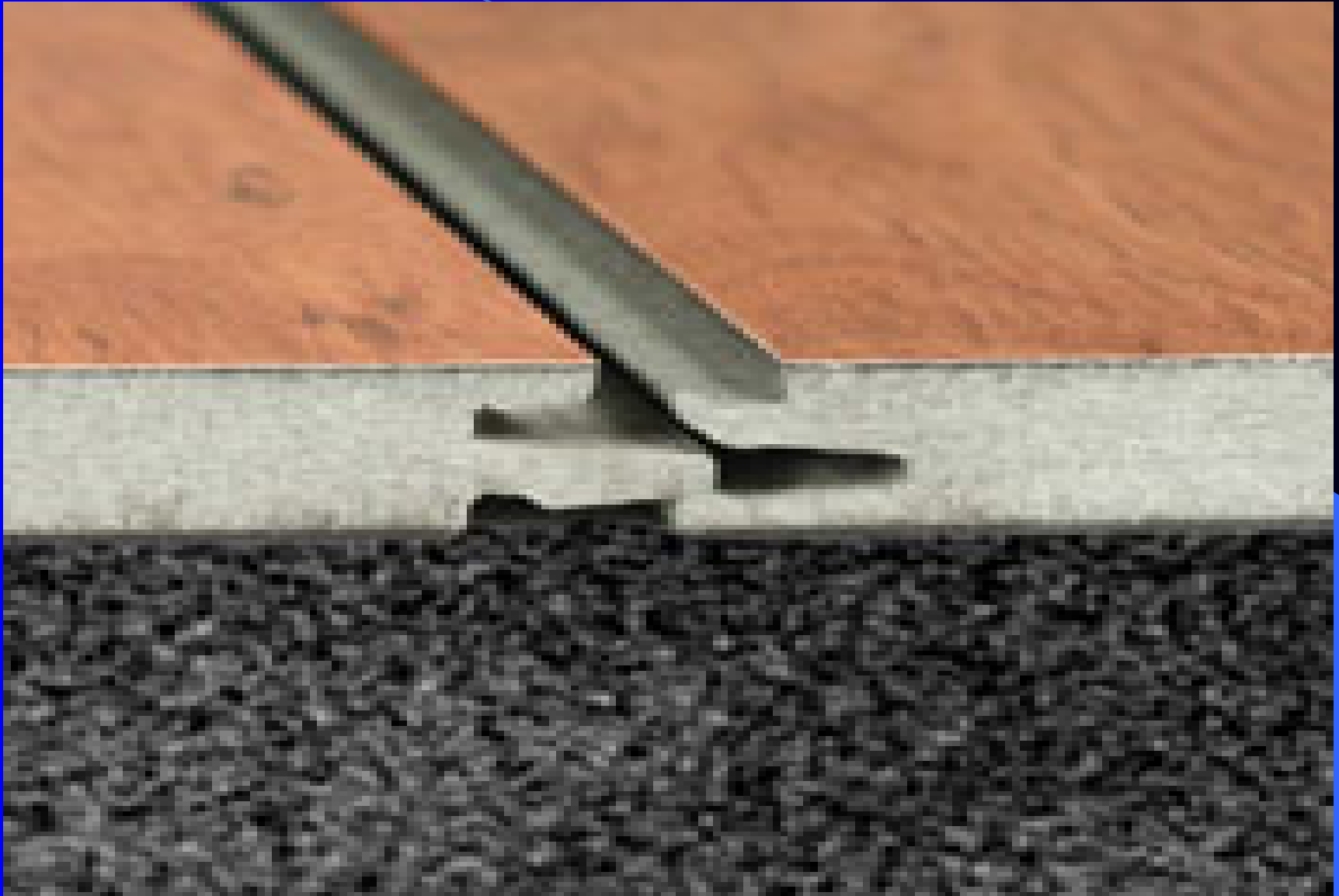
Reminder – water is a solvent – just a
slow evaporating one!!!

Flooring & Tiling

- Unprecedented market growth!!!!
- 2003 U.S Floor Covering Sales by volume
 - Laminate Flooring = 600 million sq.ft
 - Hardwood flooring = 843 million sq.ft
 - Ceramic floor & wall tile = 2.88 billion sq.ft
 - Vinyl sheet & floor tile = 3.55 billion sq.ft
 - Carpet & area rugs = 17.38 billion sq.ft

Laminate Flooring Adhesives

- Primarily PVA-based
- pH = 2-4
- 50-60% solids, typically low filler levels
- Viscosity = 5K-10K cps
- Squeeze bottle application
- HPVA/US Type II water resistance
- Vulnerable to new “glueless” systems



Hardwood Adhesives

- PVA, EVA, SBR, Acrylic offerings
- High solids content ($\geq 75\%$)
- Viscosity = 100K-300K cps
- Trowel-applied
- Water-resistant formulas available
- Primarily used for installation of dimensionally stable flooring (parquet, engineered plank)





Hardwood Adhesives

Pros:

Cost

Ease of use

Low toxicity/VOC

Cons:

“Green” strength/wet tack

Market acceptance

Ceramic Tile Adhesives

- Acrylic, Styrene-acrylic, SBR
- Heavily filled
- High solids content ($\geq 70\%$)
- Viscosity = 300K-500K cps
- Trowel applied
- Primarily vertical installations
- ANSI A136.1 water resistance







WEINE & DINE
AT MOM'S EATERY
ALWAYS OPEN

Ceramic Tile Adhesives

Pros:

Ease of application

Clean-up

Cost/Performance

Cons:

Associated dry times

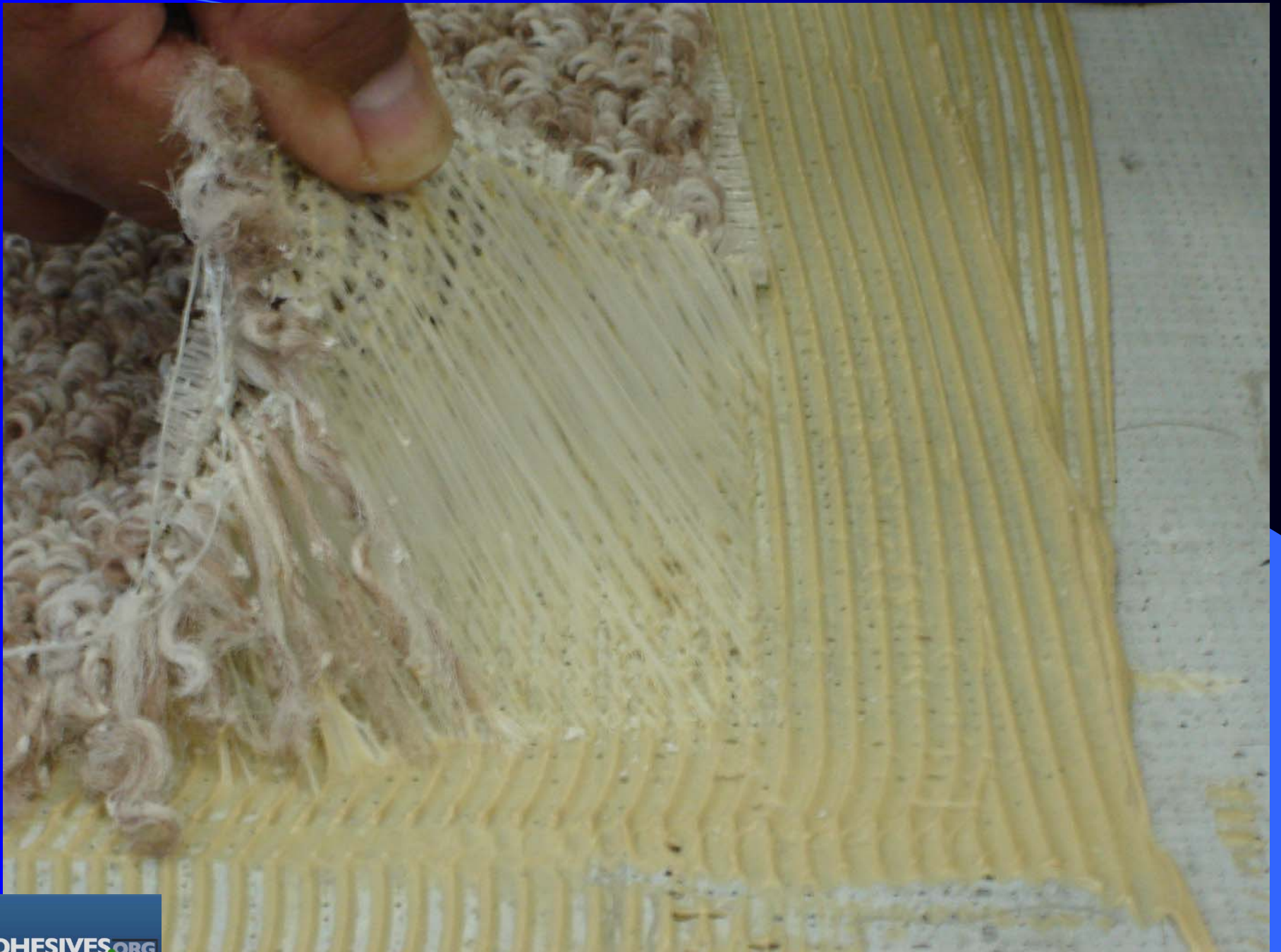
Slip resistance (large body)

Adhesion to non-porous tile

Indoor usage only

Carpet/Vinyl/Resilient Adhesives

- Primarily SBR, acrylics, PVA
- Heavily filled, tackified
- Solids Content = 55-70%, pH = 7-10
- Viscosity = 10K-100K cps
- Trowel, spray, cartridge-gun applied
- Wet lay or pressure sensitive applications











Carpet/Vinyl/Resilient Adhesives

Pros: Large commercial usage
Market share of waterbased products

Cons: Extremely cost-sensitive market

Flooring Admixtures

- Acrylic, SBR, EVA
- Used with underlayments, mortars, grouts
- Improve/enhance water resistance, adhesion, flexibility/durability (mortar)
- Enhance stain resistance, color uniformity (grouts)
- Floor primer for underlayments/patches



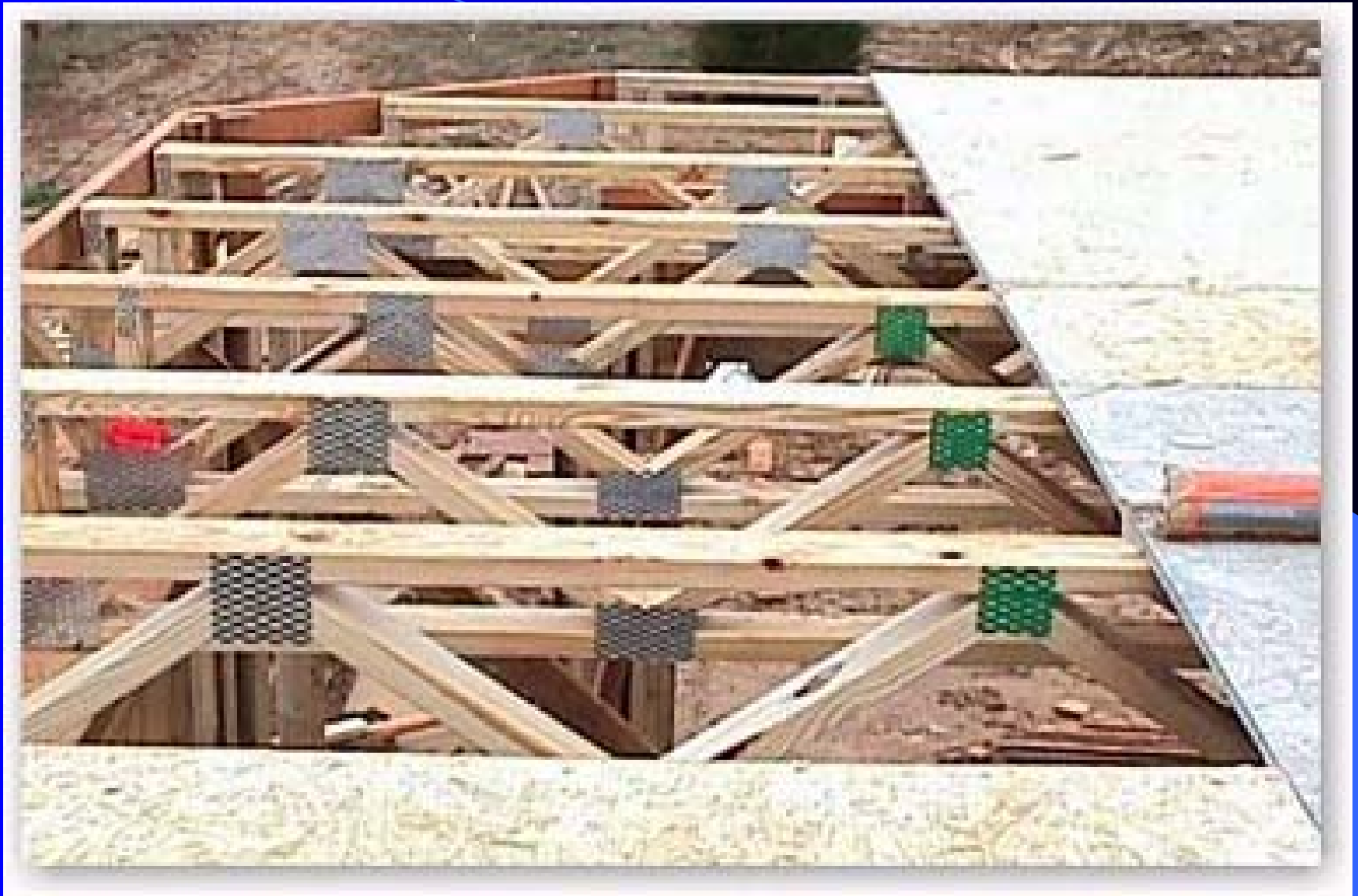


Construction Adhesives

- Subfloor, Drywall, “Multipurpose” grades available
- Varying levels of performance/uses

Subfloor/Drywall Adhesives

- PVA/EVA, Acrylic, Styrene-acrylic
- Moderately filled
- Solids content 65-75%
- Cartridge-gun applied
- Increase floor/wall stiffness, decrease floor squeaks and nail popping
- Must meet APA AFG-01 and/or ASTM D-3498, ASTM C-557 specifications







Subfloor/Drywall Adhesives

Pros: Cost/Performance
 Low toxicity/VOC

Cons: Suspect performance
 in extreme conditions

Caulks/Sealants

- PVA (caulks) or acrylic (sealants)
- High solids ($\geq 70\%$)
- Heavily filled, plasticized
- Cartridge-gun applied
- Interior/exterior grades readily available
- Specs: ASTM C-834, ASTM C-920, Fed. Spec. TTS-00230C



Caulks/Sealants

Pros: Low cost
 Clean-up
 Low toxicity/VOC

Cons: Shrinkage of 20-30%
 Suspect exterior performance (cure
 time, chalking, dirt pickup)

Patch/Repair Products

“Grab” Adhesives

Vinyl Spackling

Wood/hobby glues

Contact Adhesives

References

- 1) Brown, Michael D., Murad, Daniel S., “*BBT Capital Markets Equity Research Industry Report*”, The ChemQuest Group, May 2006.
- 2) Nick, David P., “*2005-2007 ASC North American Market Study for Adhesives and Sealants*”, DPNA International, June 2006

For more information...

Steve Lontchar

Technology Manager

Bostik, Inc.

701 Veterans Circle Warminster

Warminster, PA 18974

(215) 957-0690 x6010

steve.lontchar@bostik-us.com