Module 07.05
SEALANTS REVIEW
for EDI Training – Norfolk, VA , March 7 & 8, 2020

Original Presentation by Pecora
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What is the role of a sealant?

- Stop water and air intrusion
- Coefficient of Thermal Expansion
  - Glass = 5.1 x 10^{-6} in/in/deg F
  - Aluminum = 12.9 x 10^{-6} in/in/deg F
  - Wood = 3.0 x 10^{-6} in/in/deg F
  - EIFS = 7.5 x 10^{-6} in/in/deg F
    - Vinyl is similar to Aluminum
- Sealant joints accommodate differential thermal movement, wind loads, seismic, and other structural movements

Important Sealant Properties

- Flexibility
  - Modulus and movement capability
- Adhesion
  - Primer?
- Durability
  - Life expectancy

Common Building Sealants

- Acrylic Latex: not generally used on exteriors.
- Polysulfide: for prolonged emersion in liquids.
- Polyurethane
  - Single component
  - Multi component
- Silicone

Polyurethane - Single Component

- Not broadly specified
- +/- 25% to +100/-50% movement
- Paintable (generally)
- Low cost
- Hardens over time
- Limited life expectancy (typically 5 – 10 years)

Polyurethane - Multi-component

- Broadly used waterproofing sealant
- Up to +100/-50% movement (when new)
- Requires mixing/limited potlife
- Generally paintable
- Low cost
- Limited life expectancy (5 to 10 years)

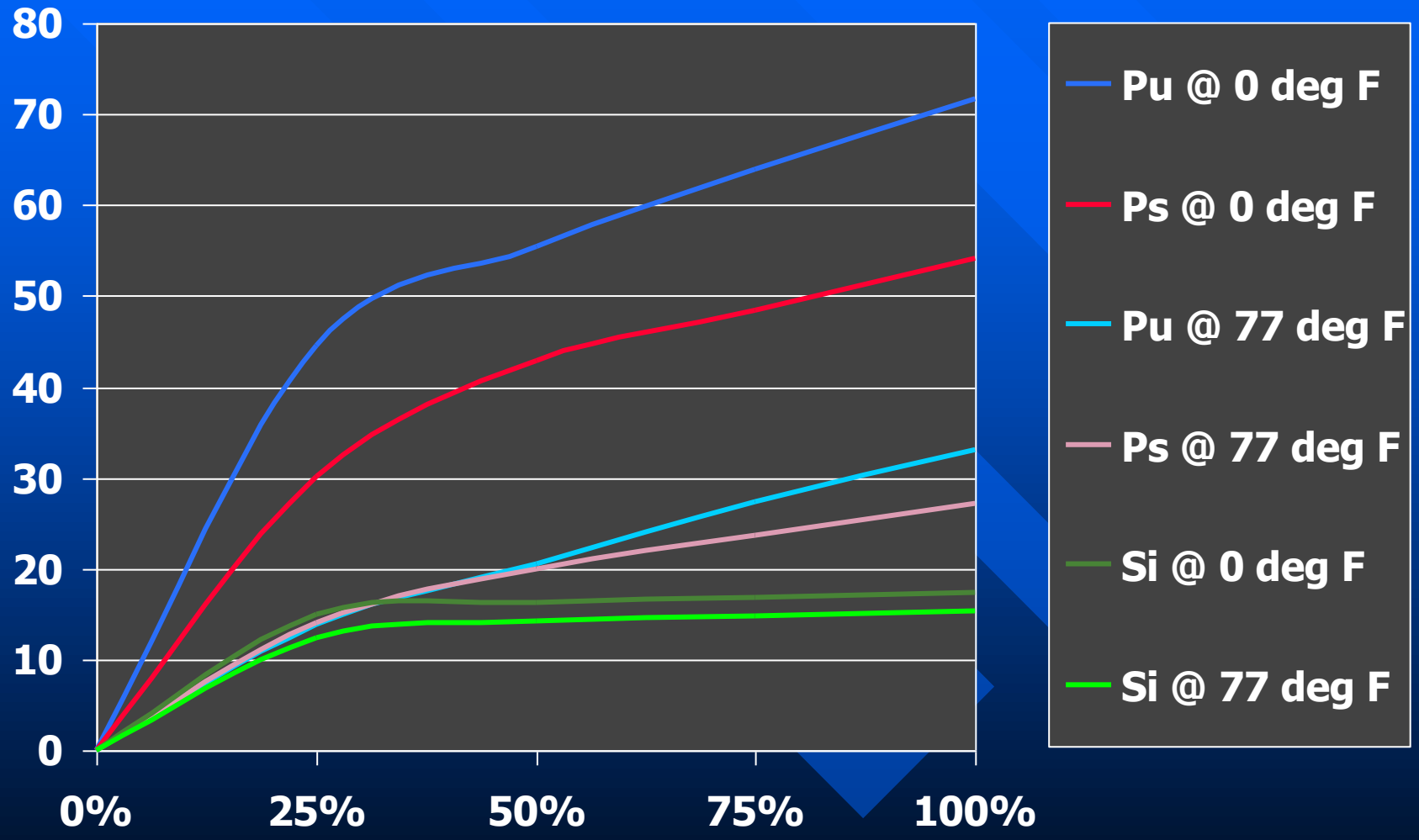
Cohesive Failure

Reversion of Polyurethane Sealant

Silicone

- Single component - moisture cure
- Becoming preferred sealant
- Up to +100/-50% movement (for life)
- “less” paintable
- Somewhat Higher initial product cost
- Long life expectance (20+ Years)

Sealant Modulus vs. Temperature

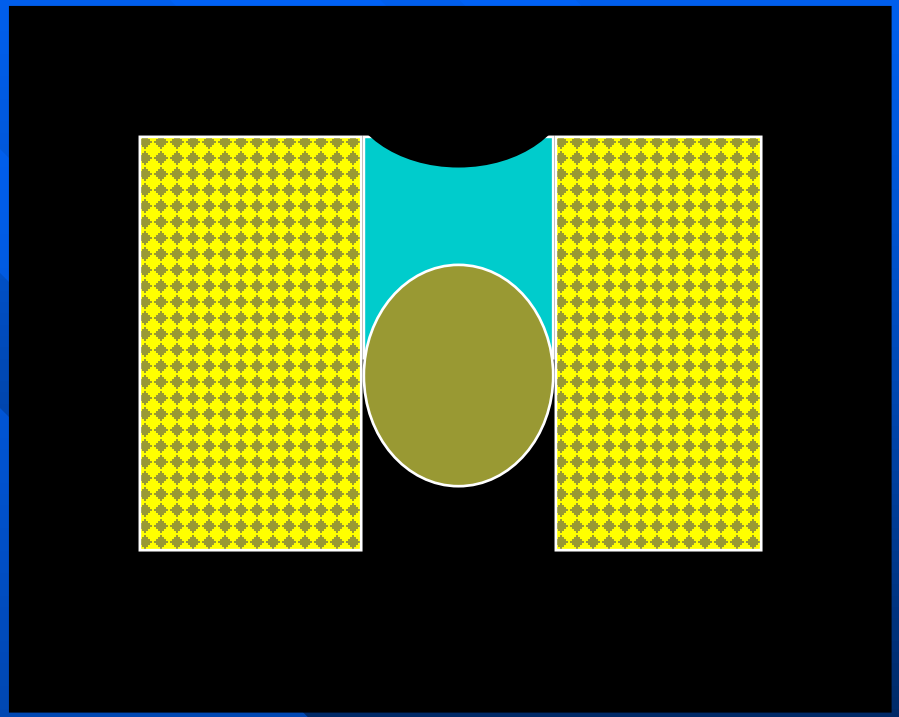


Joint Design

- Hourglass Joint
- Fillet Joint
- Overlay Joint
- Double Weatherseal

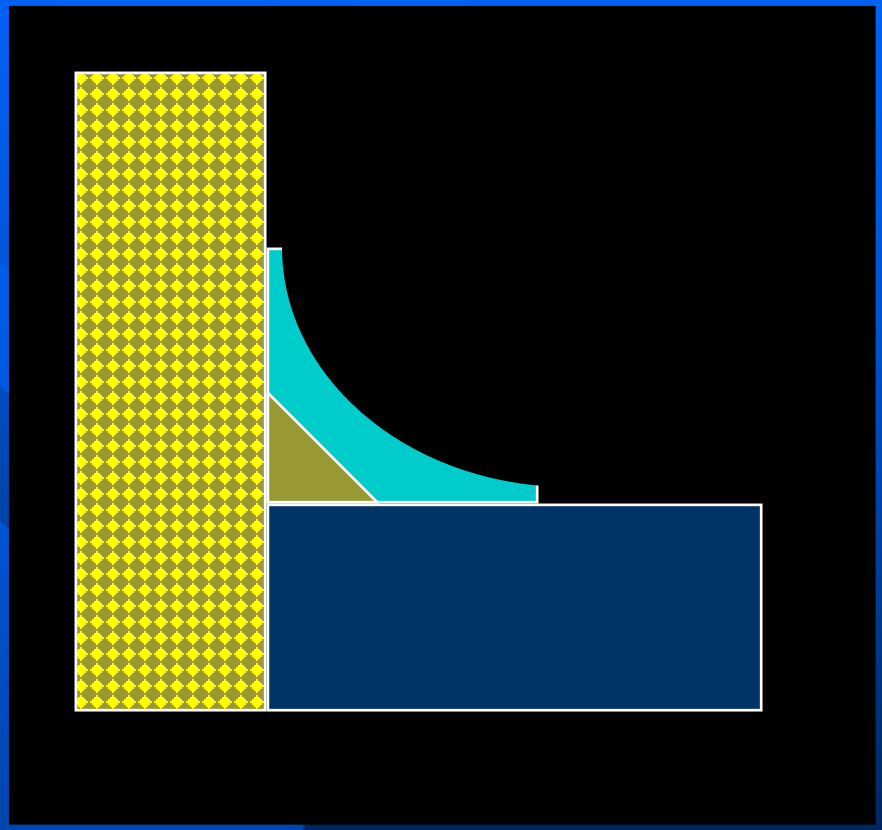
Hourglass Joint

- 1/2” to 3/4” min. width or 4 times joint movement
- 2 to 1 width to depth ratio
- Avoid 3 sided adhesion
- W/D is 2:1 up to ¾” wide then maximum sealant thickness is 3/8”.



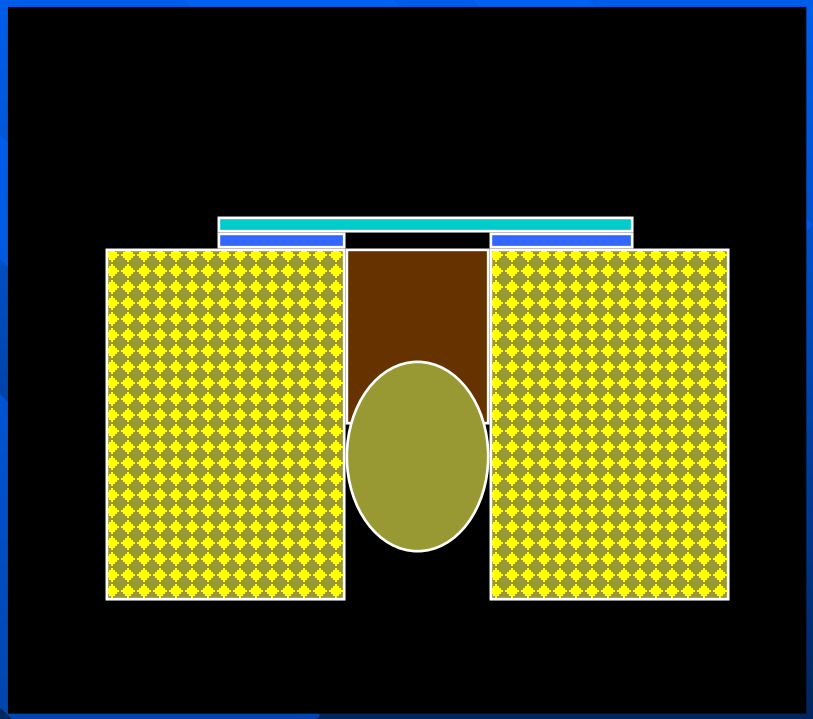
Fillet Joint

- At perpendicular surfaces
- 1/4” minimum contact
- Use bondbreaker tape or backer if different materials



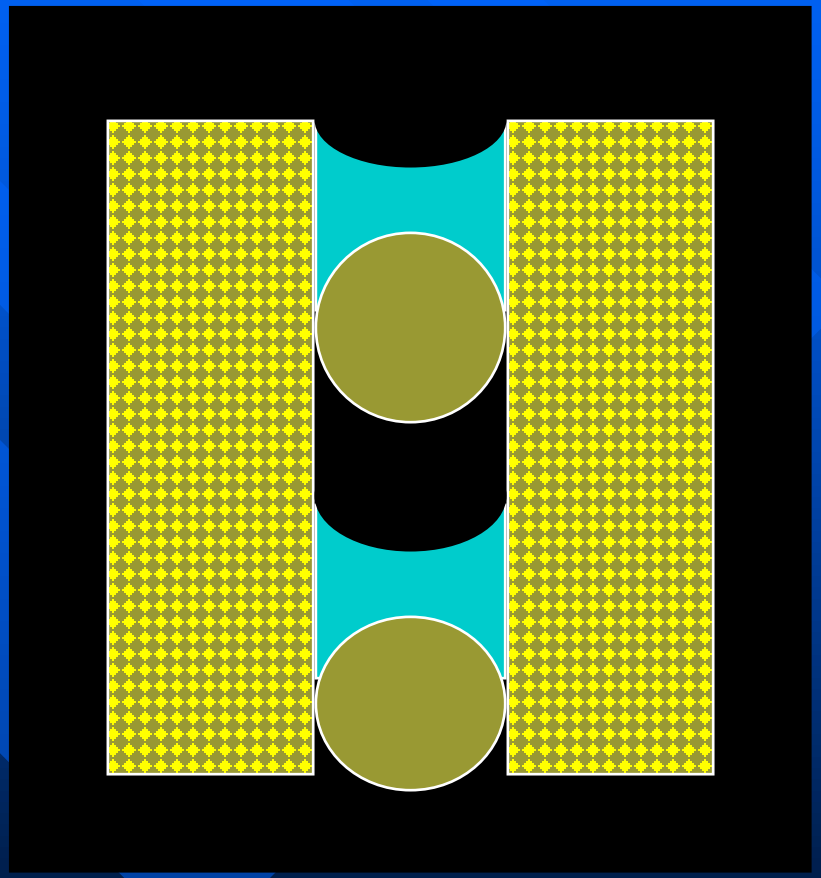
Overlay Joint

- Bridges existing sealant joint
- 1/4” to 3/8” min. contact
- Use wet sealant or preformed sealant



Double Weatherseal

- Rain screen principal
- Requires drainage
- Consider sealant curing process
- Often difficult to install



What impacts cure time?

- Size of sealant bead – primarily depth.
- Cure Temperature AND humidity.
- What is the backer? Open cell backer rod allows sealant to cure from both sides.
- Remember that adhesion is the last thing to develop in sealant cure!

Sealant Installation

- Clean
- Prime
- Install Backer Material
- Install Sealant
- Tool Sealant
- Quality Control

Why use a Backer Rod, or Bond breaker tape?

- To prevent three sided adhesion.
- To give you something to tool against (force intimate contact).

Install Sealant

- Mix sealant if required
- Push don’t pull sealant bead
- Completely fill joint

Tool Sealant

- Immediately after sealant installation
- Ensures proper joint shape
- No tooling aids (soap)
- Remove masking

Quality Control

- Follow manufacturer's guidelines
- Perform Field Adhesions Tests
- Document results of field adhesion tests

Test Methods

- ASTM C-794 Adhesion in Peel
- ASTM C-1382 EIFS/Sealant Test Method
- ASTM C-920 Standard Sealant Specification
- ASTM C-1193 Guide for Use of Sealants

Sealant Guides

- EIMA Guide and Test Method for Sealants
- SWRI - Sealants: The Professionals Guide
- Various ASTM Technical Publications
- Americas Technical Manual (Dow Corning) includes Weathersealing, EIFS Restoration, and a variety of other topics

Questions?