Joint Sealant / Filler Systems
Polyurea Elastomer Technology

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PDA MEMBER

Polyurea JS Technology

Outline:

I. What are *Polyurea Joint Sealants?*
   - Chemistry
   - History of the technology
   - Characteristics

II. Types of systems
   - performance issues

III. Polyurea joint sealant system processing

IV. Technology application

V. Conclusion / Questions

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Chemistry Overview

- From a chemistry perspective, very similar to polyurea spray elastomer systems
- Slower reaction / high flow rate
- “Softer” systems, can be “sprayed”

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History of the Technology

- **1991 - Developed as off-shoot to polyurea spray – i.e. pour applications**
- **1992 - First Commercial Use**
  - Primarily cartridge supplied at first
  - Low pressure pump systems

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Polyurea JS Advantage

- **Isocyanate component**
- **Resin blend component**
  - Amine terminated resins / no polyols
  - No catalysts
- **Consistent reaction, > 5 min gel time**
- **Usually processed using static mix tube**
- **Sets at low temperature / freezer work**
- **Stops Joint "nosing"**

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Characteristics / Advantages

- **Fast, consistent reactivity / no catalysts**
  - Usually shave filled joint within 1 hour
  - Rapid return to service
- **Relative environmental processing insensitivity – freezer applications**
- **Mechanical properties match substrate**
  - Accepts heavy traffic / forklifts
- **Good adhesion to prepared substrates**
- **100% solids formulations**
  - No solvents, no VOC's, no odor

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Typical JS Physical Properties

Tensile strength, psi	250 to 1000
Shore Hardness	A 45 to A 85
Elongation, %	250 to 800
Tear strength, pli	50 to 200
Flex/Crack Bridging -26°C / -15°F	> 1/8 inch

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Typical JS Applications

- Random cracks in concrete
  - Prior to coating with polyurea spray system
- Saw-cut / Control joints
  - In-door warehouses / retail outlets
- Small Spall Areas with Aggregate
- Airport Kerfs / conduit runs - lighting
- Expansion Joints
  - Parking decks
  - Parking garages (double “T” type)
    - Use caution here

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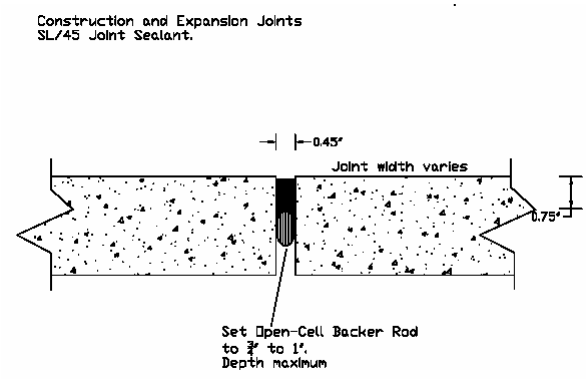
Typical JS Details



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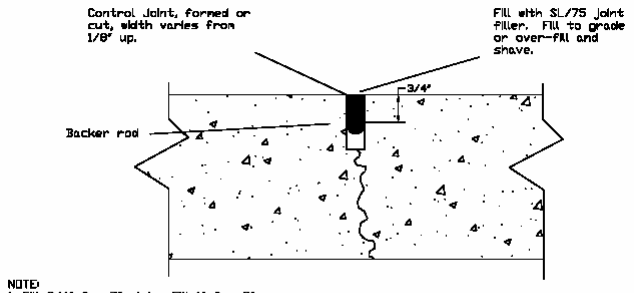
Typical JS Details



NOTE:
1. Fill 3/4" for 7" slab. Fill 1" for 8" slab.
2. Recommend use of open-cell backer rod.
3. Use for Green Cut Concrete, Semi-cured Cut Concrete.

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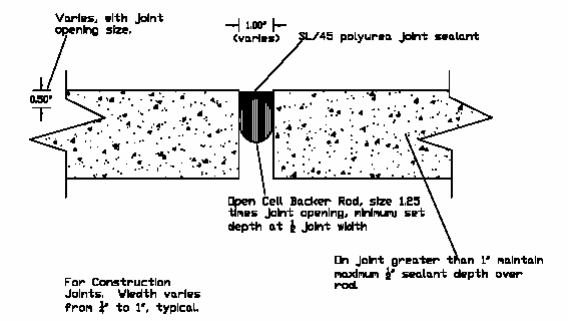
Typical JS Details



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PROCESSING BASICS

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Joint Sealant Systems

- **Should have matched material viscosity; ISO to Resin**
- **Use a 32- or 36-element mix tube**
- **Can heat to help flow / mix, especially in cool environments and application areas**

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Plural Component Equipment






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Joint Sealant Installation

Pneumatic Cartridge Applied

Machine Applied

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Joint Sealant Installation

Earlier systems “poured-in”

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Joint Sealant Installation

- Fill and shave procedure

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TECHNOLOGY APPLICATIONS

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Major Account Usage

- **Builders Square**
- **Home Depot**
- **Lowes**
- **Wal-Mart**
- **Costco**
- **Race Track**
- **Boeing – Payne Field**

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Joint Sealant Applications

- **Freezer floors**

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Joint Sealant Applications

- Industrial / Office

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Joint Sealant Applications

- Indoor and Outdoor

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Joint Sealant Applications

- **Not "*fool-proof*"**
  - Know where to use!

ABIA - Austin, Texas Airport Terminal

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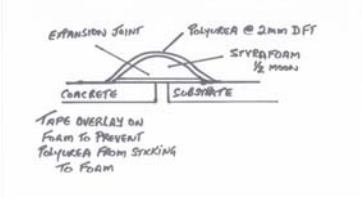
"Spray" JS System

- **Darwin Reservoir**

Joint System, 1600 meters



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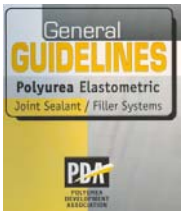
Conclusion

- **Plural Component Technology**
  - **no solvents, no VOC's**
  - **Isocyanate / amine terminated resins**
- **Sound case history base exists**
- **New Technologies emerging**
- **NACE, SSPC and ICRI work**
- **Polyurea Development Association**



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Conclusion

Special thanks to:

- VersaFlex, Incorporated
- ASTC Polymers

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