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SEALANT PERFORMANCE – JOINT DESIGN

By:

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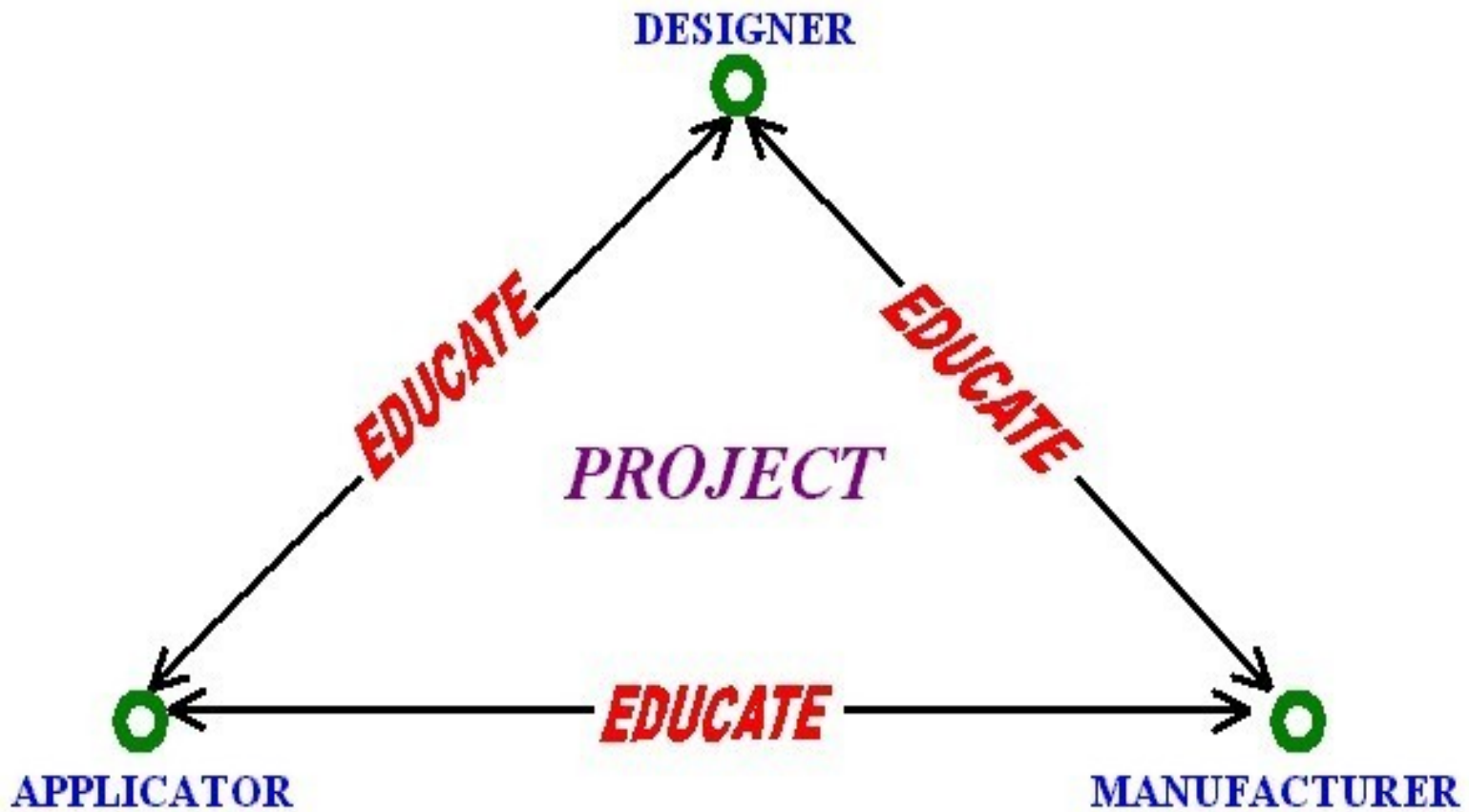
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ABSTRACT BREAKDOWN

- ◆ This presentation will deal with issues affecting our industry that lead to certain failure of sealants or joint performance.
- ◆ Some of the causes of these failures are improper design, incomplete specifications, improper application or use of sealant, as well as improper application.
- ◆ Our only choice is to focus on education and the sharing of information with the three components of construction (the designer, the manufacturer, and the applicator).



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- ◆ We will discuss how to accomplish this as well as where to turn to for help and information.



INTRODUCTION

- ◆ Steve Walter
- ◆ 1982 graduate of Purdue University in Construction Management Engineering
- ◆ Co-Owner of Trisco Systems, Inc., of Lima, Ohio
- ◆ President of Restoration Consulting Services, Inc.
- ◆ Past President of Sealant Waterproofing and Restoration Institute
- ◆ Co-Author of "Sealants: The Professional's Guide", "The Building Restoration Manual" and various Technical Bulletins



- ◆ Formed in 1975
- ◆ To enable applicators to discuss and solve common problems
- ◆ Establish a closer rapport with Architects and Engineers
- ◆ Originally a contractor-based organization represented by Principals
- ◆ Currently have numerous manufacturers represented by department managers



- ◆ 1993 allowed Associate members (Designers, Consultants, Engineers)
- ◆ One Purpose: Promote open exchange of ideas for the development of the highest standards and operating efficiency within the sealant, waterproofing and restoration industry.
- ◆ Clearinghouse sessions

THE BASICS:

THE EVOLUTION OF CAULKING/SEALANTS

- ◆ **Oakum:** used for filling seams in boats.
- ◆ **Oil-Based Caulks:** fill gaps but little movement capabilities.
- ◆ **Acrylics:** a little better movement capabilities.
- ◆ **Polysulfides:** discovered by accident in 1927. Enhanced in the 1950s.
- ◆ **Polyurethanes:** developed in 1940 by Otto Bayer in Germany.
- ◆ **Silicones:** spurred by the need for increased flexibility and longevity.

THE BASICS:

TYPES OF SEALANTS AVAILABLE TODAY

- ◆ Polysulfides
- ◆ Polyurethanes
- ◆ Silicones
- ◆ Acrylics
- ◆ Precompressed expanding foam
- ◆ Preformed joint tape
- ◆ Preformed extruded thermoplastic expansion joints
- ◆ Fire Stops
- ◆ Myriad of hybrids of the above
- ◆ Sometime all of these are on the same job site

CONDITIONS WE ARE SUBJECTED TO EVERY DAY

- ❖ **Specifications**
- ❖ **Competition**
- ❖ **“Real World” Project Conditions**
- ❖ **Field Conditions**
- ❖ **Sealant Installation “Opportunities”**
- ❖ **Remedial Challenges**

CONDITIONS WE ARE SUBJECTED TO EVERY DAY: SPECIFICATIONS

❖ A Recent Specification

1. Mildew-resistant silicone sealant (5 manufacturers)
2. Multicomponent nonsag urethane sealant (14 each)
3. Multicomponent pourable urethane sealant (9 each)
4. Single-component nonsag urethane sealant (7 each)
5. Single-component pourable urethane sealant (5 each)

❖ Caulk all control joints (expansion joints)

❖ 20 year+ warranties

CONDITIONS WE ARE SUBJECTED TO EVERY DAY: COMPETITION

- ❖ **Generally small firms**
- ❖ **Branches of waterproofing companies**
- ❖ **Branches of restoration companies**
- ❖ **In and out of business continually**

CONDITIONS WE ARE SUBJECTED TO EVERY DAY:

"REAL WORLD" CONDITIONS

- ❖ Sealants are a commodity, like carpet
- ❖ "Get here now!"
- ❖ "Leave here now!"
- ❖ "I don't care what the weather is--get it done!"
- ❖ "I don't care what the joint size is--caulk it!"
- ❖ "Just get the goo in the joint."

CONDITIONS WE ARE SUBJECTED TO EVERY DAY: FIELD CONDITIONS

- ❖ Contaminated joint
- ❖ Improperly sized joint
- ❖ Cure times of mortar/concrete
- ❖ Movement during cure
- ❖ Expansion joints vs. control joints (debris in joint)
- ❖ “Hey boss, we saved money on this job--I used all the big cans and brought back all the little ones”
- ❖ What’s in the tube?
- ❖ To prime or not to prime? What did I bid?

CONDITIONS WE ARE SUBJECTED TO EVERY DAY: INSTALLATION "OPPORTUNITIES"

- ❖ Different type of metals
- ❖ Glass (structural and nonstructural adhesives)
- ❖ Masonry
- ❖ EIFS
- ❖ Synthetics/plastics
- ❖ Concrete (poured and precast)
- ❖ Wood
- ❖ Light and dark colors
- ❖ Multiple combinations of all the above on one job!

CONDITIONS WE ARE SUBJECTED TO EVERY DAY: REMEDIAL CHALLENGES

- ❖ **What did the last guy do?**
- ❖ **Subsurface and structural factors**
- ❖ **EIFS and mold**
- ❖ **Asbestos in old sealant materials**
- ❖ **What will happen to the building after we do this repair?**
- ❖ **Contaminants or other bond inhibitors**
- ❖ **Sealant staining**
- ❖ **What material do I use? Designing repairs.**
- ❖ **Increased liability**

RESULTS OF THESE CHALLENGES

- ❖ Any one or combination of the previous conditions will result in failure!
- ❖ Immediately
- ❖ Right after the warranty period
- ❖ Within a few years after completion
- ❖ 60% of call backs are water-related
- ❖ "Build it out of brick--it lasts forever!"

WHAT CAN WE DO?

DESIGNER/SPECIFIERS

- 1) Know what you are specifying and why.
- 2) Be clear and/or show designed joint dimensions and tolerances.
- 3) Be more involved with field quality control.
- 4) Specify using primers--don't rely on "per manufacturer's recommendations."
- 5) Demand and be involved with field-testing (i.e., pull tests). State this in the specifications.

WHAT CAN WE DO?

MANUFACTURERS/DISTRIBUTORS

- 1) Provide technical competence in the field.
- 2) Provide "Help"--we don't want to be sold!
- 3) Tell us when a product won't work.
- 4) Develop simple guidelines when and how to use your product.
- 5) Stop selling long-term warranties or clarify.
- 6) Support a good specification and don't support an improper specification.

WHAT CAN WE DO?

APPLICATOR

- 1) Become better educated--in the field (owner and manager challenge).
- 2) Don't take the job on the cheap (evaluate risk vs. reward).
- 3) Document nonconforming joint conditions.
- 4) Do not install when conditions are detrimental to performance.
- 5) Instill quality control measures in the field (perform own pull tests).
- 6) Don't give in to extended warranty pressure, and be honest that all jobs have a recognized percentage of joint failure.

A close-up photograph of a person's hands and forearms on a blue tennis court. The person is wearing a red shirt. The hands are positioned on the court surface, with fingers spread, as if about to serve or return a ball. The court has white lines. The background is a bright blue sky.

→ HOW DO WE TURN A MARKET AROUND?

→ HOW DO WE TURN AN INDUSTRY AROUND?

MAKE A CHANGE!

* Sealant Validation

- Independent NVLAP lab testing of off-the-shelf product
- Test to ASTM C-719, ASTM C-794, and ASTM C-661
- Receive validation number and certificate and seal for literature
- Contact Sealant Waterproofing and Restoration Institute

* Contractor Certification

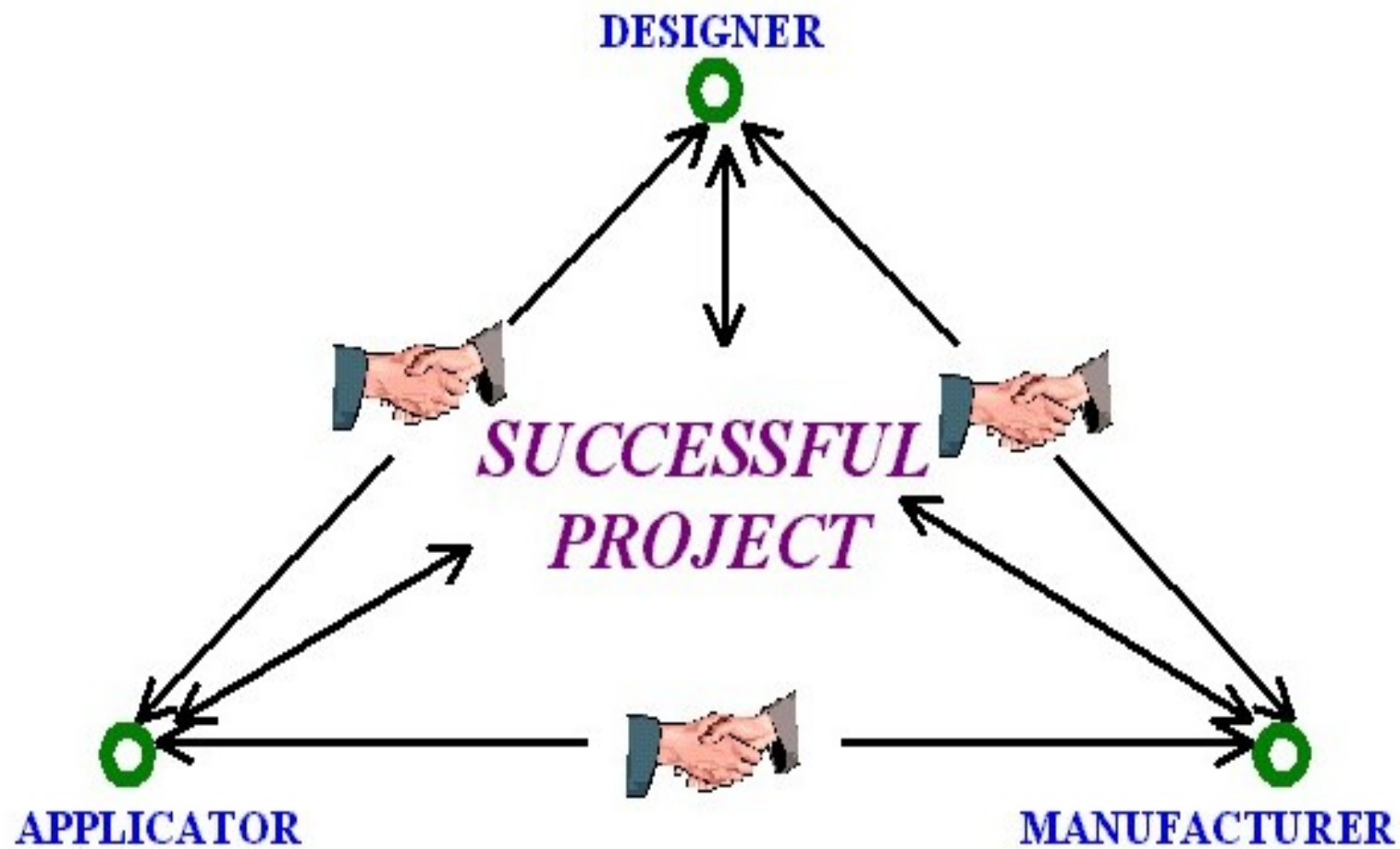
- Mean it!
- Training

* Predesign Conferences

* Preconstruction Conferences

MAKE A CHANGE!

- ★ **“In-Process” Investigations**
- ★ **Industry Alliance and Sharing**
- ★ **Industry Education**
 - Promote education to designers and applicators
 - Stimulate and provide forum for open and frank debates
- ★ **Promote “Partnering” for Projects**
- ★ **Stop Treating Caulking as a Commodity**
- ★ **Establish Industry Standards**



For more information...

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