Henri Fennell, CSI/CDT

Henri is an architect and building envelope specialist with over forty years of experience in the construction industry. He was a pioneer in the solar industry, introduced the installation technique for field-applied closed-cell cavity-fill polyurethane foam, developed a pressurized theatrical fog quality assurance technique and protocol, and has designed and constructed a net-zero energy research structure in Antarctica. He has four energy-Related U.S. patents.
HCF foam experience

1. First spray foam project was in 1971
2. Foam manufacturing from 1972 to 1978
3. Foam contracting from 1979 to 2009
   - Developed the method for injecting closed-cell foam on site
   - Installed ~ 3 million pounds of foam
4. Foam consulting from 2009 to present
   - Foam project planning
   - BE problem diagnostics & inspections
   - Installation commissioning
   - Remediation planning
5. Noteworthy foam projects include:
   - Bruce Museum, The Big Dig, 4 American Ski Grande Hotels in the Northeast, Net-zero energy weather station in Antarctica, The Guggenheim Museum
6. Two patents and two published technical papers related to foam products and quality control
Interpreting Infrared Images for Building Diagnostics in Foam Installations

Henri Fennell, CSI/CDT

www.polyurethanofoamconsulting.com
ANTITRUST POLICY STATEMENT FOR SPRAY POLYURETHANE FOAM ALLIANCE MEETINGS

- It is and shall remain the policy of the Spray Polyurethane Foam Alliance (“SPFA”), and it is the continuing responsibility of every SPFA member company, SPFA meeting or event participant, as well as SPFA staff and leadership to comply in all respects with federal and state antitrust laws. No activity or discussion at any SPFA meeting or other function may be engaged in for the purpose of bringing about any understanding or agreement among members to (1) raise, lower or stabilize prices; (2) regulate production; (3) allocate markets; (4) encourage boycotts; (5) foster unfair or deceptive trade practices; (6) assist in monopolization; or (7) in any way violate or give the appearance of violating federal or state antitrust laws.

- Any concerns or questions regarding the meaning or applicability of this policy, as well as any concerns regarding activities or discussions at SPFA meetings should be promptly brought to the attention of SPFA’s Executive Director and/or its legal counsel.
Remediating Problems in Foam Plastic Insulation Installations

This program introduces the building science, processing, installation, and post-installation problems in field-applied polyurethane foam plastic installations. The four most common types of foam material quality problems are presented, along with the means of determining which types are in a given project or area.

This program will discuss when foam material can be stabilized and repaired vs. when it has to be partially or completely removed and replaced, and finally, the strategies for remediating each type.

It also emphasizes the importance of addressing air quality requirements during and after the remediation work.

Case studies provide examples of problem foam installations for.
Learning Objectives

1. Participants will be able to identify typical problems and failures in foam installations

2. Participants will be able to differentiate between foam that should be replaced or repaired

3. Participants will be able to select the appropriate remediation strategies for problem foam installations
Interpreting Infrared Images for Building Diagnostics in Foam Installations

Copyright Materials

This presentation and the related handout material is protected by US and International Copyright laws. Reproduction, distribution, display and use of the presentation and the related handout material without written permission of the speaker is prohibited.

© HC Fennell Consulting, LLC 2016

www.polyurethanefoamconsulting.com
The five most common types of foam quality problems

• Dimensional stability
• Adhesion
• Odors
• Related moisture problems
• Inadequate fire protection
Dimensional stability

- Picture here
Adhesion

• Picture here
Odors

• Pictures here
Related moisture problems

• Insert pictures here
The foam quality problems are caused by

- Building science issues
- Improper processing
- Installation protocols
- Post-installation protocols

- Note: I didn’t include poor quality raw materials in this list
Building science issues

• Insert pictures here
Improper processing

- Insert pictures here
Installation protocols

• Insert pictures here
Post-installation protocols

• Insert pictures here
The means of determining which types are present in a given project or project area

• Visual inspection
• Density check
• Slit testing
• Hot and cold tests
• Odor protocols
• Laboratory testing
Visual inspection

• Insert pictures here
Density check

• Insert pictures here
Slit testing

• Insert pictures here
Hot and cold tests

• Insert pictures here
Odor protocols

• Insert pictures here
• Sample VOC report
Laboratory testing

• Insert sample lab reports here

• Schubert chart
When can problem foam material be stabilized and repaired vs. when it has to be partially or completely removed and replaced

• Health first – vapors/odors can be managed, but not remediated

• Determine if dimensional stability can be achieved if there are no vapors – if so, remediation is possible
Health first – vapors/odors can be managed, but not remediated

• Are the vapors a health hazard?
• Rate of decline
• Testing issues
Determine if dimensional stability can be achieved if there are no vapors – if so, remediation is possible

• Insert picture here
What the strategies are for remediating each type of problem

• Removal and replacement of material causing long-term health problems
• Repair of salvageable material
• How to address air quality requirements during and after the remediation work
Removal and replacement of material causing long-term health problems

• Insert picture here
Repair of salvageable material

• Localized removal and replacement
• Stabilization
• Isolation
• Ventilation
• Combinations
Localized removal and replacement

• Insert picture here
Stabilization

• Insert picture here
Isolation

- Insert picture here
Ventilation

• Insert picture here
Combinations

• Insert picture here
How to address air quality requirements during and after the remediation work

• Insert pictures here
Thank you for your time!

QUESTIONS??

This concludes this Continuing Education Systems Program

By: Henri Fennell, CSI/CDT
© H C Fennell Consulting, LLC 2016
www.polyurethanefoamconsulting.com
Cell: 802-222-7740