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 closed-cavity-fill polyurethane foam 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 1973 to 1979
3. Foam contracting and BE consulting from 1979 to 2009
   - Developed the method for injecting closed-cell foam on site
   - Installed ~ 5 million pounds of foam
4. Foam and BE commissioning from 2009 to present
5. Noteworthy foam projects include:
   - 1977 net-zero solar project in Boston, The Big Dig, 4 American Ski Grande Hotels in the Northeast, Net-zero energy weather station in Antarctica, The Guggenheim Museum
6. Two US patents and four published technical papers related to foam & QA

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What Contractors Need To Know About Spray Foam - Q&A

Thursday, March 10, 2016 - 10:30 am

By: Henri Fennell, CSI/CDT

Course Description

What Contractors Need To Know About Spray Foam

Spray foam is an essential tool in the high performance building toolbox, yet many builders have concerns about using the material including subpar installations; how to protect workers, occupants and spaces outside the spray zone; off-gassing; the global warming potential of blowing agents, and even foam failures.

In this session, Henri Fennell, a leading spray foam expert with more than 40 years of experience, will discuss what contractors need to know and to do to ensure safe, high quality installations. Common problems will be addressed as well as strategies for avoiding them.

The session will conclude with an extended Q&A, so attendees are encouraged to come with questions.

What Contractors Need To Know About Spray Foam

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Question #1

What is there to know about open-cell foam?

Advantages - cost, ability to fill spaces, no lift delay

Disadvantages - permeability, frequent installation problems like voids, space needed

Question #2

What is there to know about closed-cell foam?

Advantages - vapor closed, high R-value per inch, structure, thin lifts are required - help cover voids?

Disadvantages - cost, high GWP blowing agents, installation time for lifts-smaller jobs, no filling closed cavities

Question #3

How does slow-rise injection foam work?

Consider the following: Needs, methods, equipment, potential markets (case studies).

BUILDINGENERGY MASTERS SERIES

THE INJECTED POLYURETHANE FOAM (IPF) METHOD

COURSE DESCRIPTION (http://nesea.org/BEMS)

Spend six weeks with Henri Fennell learning to use injected open and closed-cell polyurethane foam to insulate, air seal, and provide vapor control in buildings. Although this course focuses primarily on existing buildings, it also introduces additional applications that demonstrate how broad the markets for the IPF method can be.

This course is for professionals who want to add this valuable service to their current offerings, or want to incorporate it into their planning for retrofit projects, thus maximizing the opportunities available to them. No more gut demolition for occupied, historic, seemingly inaccessible, or other energy-upgrade projects. No more using spray foam for cavity-fill applications and hoping it works!

If your perception is that spray foam is the only way to insulate a building using foam, or that dense pack is the only way to fill a closed cavity, this course will provide you with new, proven options for approaching retrofit projects.

As a capstone project, you will plan a complete IPF installation for a building of your choice with the help of Henri and your classmates.

Expect to learn:

- How to assess a project to determine if IPF is more appropriate than SPF for a specific application
- How to specify or incorporate IPF into your standard work requirements for various closed-cavity applications
- Which IPF product is the right one for your project
- Which IPF method and delivery system is appropriate for a given access challenge
- How to avoid blowouts, voids, and other potential problems that can occur when using the IPF method
- How to protect the structure and the occupants during an IPF installation
- How to properly process the IPF product to assure material quality and long-term installed performance – with both low-tech and with high-tech processing equipment
- How and when to install the IPF material using temporary forms or temporary reinforcing
- Which of the variety of extensions systems to use in remote-access applications
- How to take advantage of the exothermic heat produced by the chemical reaction to quality control an installation in any season using infrared thermography to answer the inevitable question, “How do you know that you got it all?”

Question #4

What tips could you suggest for a failure-free installation?

Consider the following: processing, installation, building science, site protection (codes), performance verification.

Question #5

What are important guidelines regarding health, safety, and customer satisfaction issues?

Consider the following: ventilation, evacuation, personal protection, site protection, CAZ safety.

Thank you for your time!

QUESTIONS??

This concludes this Continuing Education Systems Program

By: Henri Fennell, CSI/CDT

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SPF Properties

Table 1: Summary of SPF properties

	Sealant	Low-Density or ocSPF	Medium-Density or ccSPF	Roof SPF
Density (pcf)	0.6 – 1.8	0.4 – 0.7	1.7 -2.3	2.5 – 4.0
Thermal Resistivity (R/in)	not reported	3.6 - 4.5	5.8 - 6.8	5.8 - 6.8
Air Impermeable Material	*	✓ (>4-6")	✓ (>1")	✓ (>1")
Integral Air Barrier System		✓	✓	✓
Class II Vapor Retarder			✓ (>2")	✓ (>2")
Water Resistant			✓	✓
Cavity Insulation		✓	✓	
Continuous Insulation		✓	✓	✓
Low-Slope Roofing				✓
Structural Improvement			✓	✓

I would add closed-cavity low slope insulation to this with a check in the center two boxes. These are the only code compliant materials for this application.

Courtesy of The Center for the Polyurethanes Industry and the Spray Foam Coalition - American Chemistry Council (ACC)

To take

- Long drum thermometers
- Calibration tubes and rack
- Deep hole saw
- Calibration adapters
- Ratio Monitors