



Introduction to Polyurethane Foam in Construction Materials & Applications

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Course Description/Abstract

This program commences with an overview of insulation systems, investigating different types of insulation, their performance, and how they compare to polyurethane technologies. Particular attention is then given to polyurethane foams, exploring their development and providing an opportunity to examine samples of open-cell and closed-cell foams. An in depth look at the physical properties of the material itself, considers plastics, densities, blowing agents, and zero ozone depletion potential (ODP) closed-cell polyurethanes. The environmental advantages of the improved formulations of Freon, an essential blowing agent, are elaborated on. Basic code issues involving fire protection, ventilation, and R-Value drift are discussed. Health, safety and welfare issues are dealt with as the applied uses of polyurethane foams in thermal envelopes and the building as a system are explained. The purpose of the thermal envelope and how it functions properly is elaborated on, providing the context for explaining how polyurethane foams are installed and how quality-control measures are executed. Air quality exposition focuses on fresh air from active and passive ventilation systems; make-up air for combustion appliances; and indoor air quality problems from the envelope cavity itself (condensation, vermin, fibers, and out-gassing). Processing and applications are covered in detail. A slide presentation and demonstration of specialized QA testing equipment supplement this program. Case studies are included to demonstrate various field applications. (Hands-on in-field training is included in the full version of this program)

Equipment/Safety Training

1. Basic overview of how the system works as a whole
2. The function of each piece of equipment and how they work
3. Start-of-day things to do
4. Things to watch upon startup, during spraying
5. Maintenance priorities
6. Troubleshooting
7. Safety gear and equipment safety (wearing proper equipment, safety features on all equipment)
8. End-of-day things to do

Applicator Training

1. Getting comfortable with your Rig
2. Understanding the building envelope
3. Analyzing and preparing substrates
4. Spraying unvented attics vs. vented attics
5. Weather variables and what to do
6. Recommended spray team setup and how it should function
7. Typical day of spraying- walk thru good day, bad day
8. Problems you will/may encounter on-the-job
9. How much should you be spraying per day?
10. Prepping up and cleanup procedures/ tools to use and products to avoid
11. Things you can't spray on and what to do
12. Spraying various substrates and how they can effect foam
13. Flash and batt and how much you should be spraying
14. What to look for while your spraying- popcorn, smooth, too cold, too hot, crystallizing
15. Safety procedures in case of spill, Iso in eyes, on skin, etc
16. Medical emergencies
17. When to use ignition barrier, thermal barrier
18. What do I do with empty drums?

Product Training

1. What is Spray Foam Polyurethane
2. A-ISO vs. B-POLYOL
3. Health risks w/ISO, POLYOL, together, MDI, out-gassing
4. Closed cell vs. Open Cell
5. Soy-based vs. Non-soy-based
6. Features and benefits
7. Tech data sheet – what is it and how do read it
8. Why is Permeability important?
9. Vapor barrier vs. vapor retarder
10. UL, FM, ASTM, ICC, NFPA, important accreditations, tests and accolades
11. Ignition/thermal barrier product info
12. Coatings and when they are used

Learning Objectives:

1. Participants will be able to select the correct polyurethane foam product and installation method for their specific projects.
2. Participants will be able to identify the building science issues related to the use of foam.
3. Participants will be able to differentiate between open and closed-cell foam products.
4. Participants will be able to calculate the per-installed R-value cost of foam materials.
5. Participants will be able start up and shut down industry-standard foam equipment.