2025 SPRAYFOAM Convention & Expo
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Do It Right, Do It Once.

KEEP YOUR ROOF PROTECTED BY MAINTENANCE.

GARY HARVEY

My name is Gary Harvey. I was born and raised in London, England and moved here in the mid-70s. After completing my schooling, I jumped into this industry which I love so dearly. Other than a brief four-year stint as Director of Manufacturing for a subsidiary of Boeing in Seattle (my second passion, aviation), I have been in the roofing, waterproofing, and building envelope field since 1987.

I had the honor and privilege of working at a high-end roofing facility in Palm Springs which specialized in ultra-high-dollar custom estate homes, where I learned the meaning of quality, craftsmanship and pride in one's work product. Wanting to learn the other side of the industry, I pivoted to commercial roofing at Bryant Universal Roofing Company, where I was exposed to cutting edge roofing solutions, the most modern equipment and an incredibly diverse portfolio of projects.

In 1996, my wife Shena (who I met while at Boeing) and I moved to the San Francisco Bay area to raise our family. In July 1996 I joined the Wedge Roofing team. As President / CEO, I am fortunate to oversee a facility employing over 60 persons. I enjoy the best of both worlds, with half of our personnel in the residential side of the industry, and the other half firmly planted in the commercial side.

I enjoy giving back to the industry by lecturing, teaching, and mentoring, whether in the Green Building segment of our industry, spray foam roofing/insulation, or building envelope practices. I am also an accomplished soccer referee, officiating college, state and national teams.

Ask me about my World Cup team experiences.

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Do It Right, Do It Once.
Keep your roof protected by maintenance

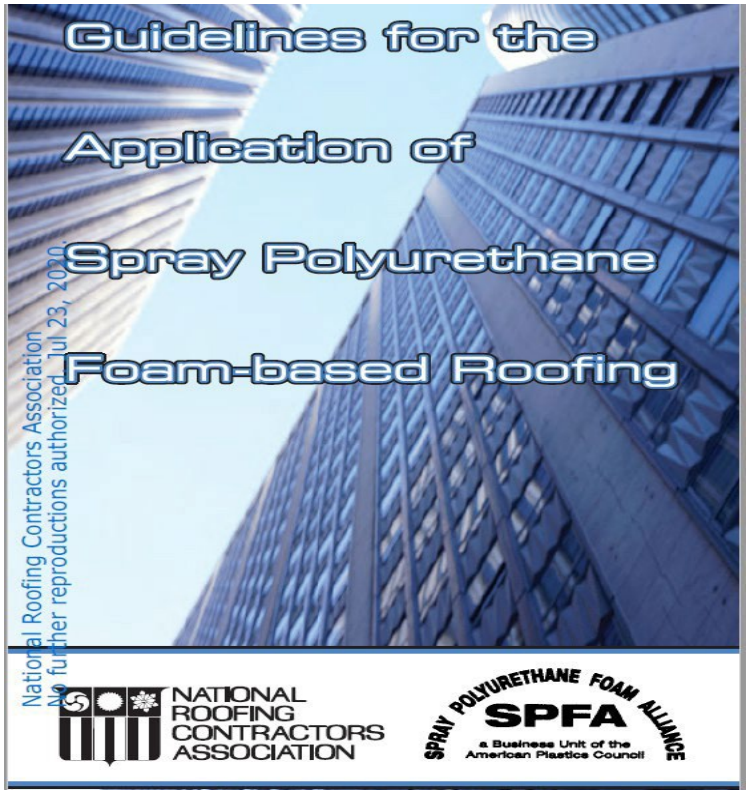
- Have you ever said, "I've always done it this way"? The reality is you need to make sure it is the correct way – it matters.
- If you do it right the first time, you only need to do it once.
- This presentation will show you;
- what happens when you get it wrong.
- The cost of returning to make repairs
- including pitfalls to avoid.
- where the correct information is,
- how to get it, why it matters
- t is said that following the spec is one way to "do it right"!!

COURSE OBJECTIVES

- ❑ Understand Industry guidelines for Best Practice for roofing systems and what ramifications are possible.
- ❑ Costs involved when issues start to happen with your roof system
- ❑ Understand how a Preventative Maintenance Program will increase life expectancy of your roof system.
- ❑ Understand the best time to start a PM program, and what it looks like

Guidelines for Application of Roofing Products

- By a show of hands, who knows of, and has read this guideline published by NRCA/SPFA? (31 pages)
- **Statement of Purpose**
- This document provides guidelines for on-site evaluation of spray polyurethane foam- (SPF-) based roof systems during the application process.
- It stresses thorough, continuous inspections during construction process, to recognize and correct variances as they are detected.



SPFA SPRAY POLYURETHANE FOAM ALLIANCE

Significance of Industry Guidelines/Best Practices

- Why are these important factors to consider? (We have some examples of different QA procedures to show)
- The NRCA/SPFA create guidance manuals to help educate **(owners)** those who purchase roofing systems and **(contractors)** roofing professionals. They are based upon industry professional knowledge/and best practices. They often describe what can be expected throughout the complete roofing process. However, this process has a cost associated with selected services. Most procurement professionals lean towards the most economic proposal or "low bid".
  - often, jobsite quality control is viewed as extra work, or someone is watching over your shoulder by the applicator/crew, you often hear "I've been doing this for 20 years, and all my roofs are perfect!"
  - 90% time, most roofs perform as expected, which is good.
  - What happens the other 10% of the time?
    - A building structure moves and cracks thru the substrate and thru the foam, presenting a leak area?
      - Are you responsible as the contractor because you installed it? Does your "team" have adequate experience in Structural Engineering practices, was the existing roof system dimensionally stable (infrared scan performed/documented)? Adequate wind uplift attachment? Correct edge termination attachment?

Quality Control Guidelines for Application of SPF Roof systems;
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Quality Control/Assurance

- Quality assurance, when performed, is the responsibility of a building owner's representative (e.g., architect, engineer, roof consultant) or representative of the material manufacturer/supplier.
- Written documentation should follow every inspection with copies distributed the following day to field personnel (by a Qualified Roofing Professional, **knowledgeable in SPF systems**)

- **Visual Examination should take place Before and During application,**
  - **Decks—New Construction/Tear-off** A building owner, designer and deck manufacturer/installer are responsible for providing for the acceptable support/substrate conditions , Roofing contractors inspect and accept roof deck surfaces.
- **Existing Roof Substrates**
- When re-covering an existing roof system, a designer is responsible for analyzing the structural roof deck including deck integrity, system compatibility, existing/present damage, moisture condition, wind uplift and building code requirements.

Application of Spray Polyurethane Foam- QC

- A visual exam can determine:
  - Materials are as specified.
  - Temperature, humidity and ambient conditions are as specified.
  - Wind conditions are acceptable for application and protection against overspray.
  - Equipment is operating at the proper pressure and temperature.
  - SPF is rising and/or reacting properly.
  - Minimum lift thickness is 1⁄2 inch (13 mm) or as specified except where a feathered edge is necessary to complete a pass.
- Minimum overall SPF thickness should be 1 inch (25 mm) or as specified for coated and membrane- surfaced systems
- 1 1⁄2 inches (38 mm) or as specified for aggregate covered systems and over rough, textured surfaces.
- Surface texture is as specified.
- SPF is applied in the full thickness within the same day.

Primers, Vapor Retarders, Separation Layer

❑ Primers; Pro's/con's from audience???

SPF adheres well to most construction materials.
Primers are often used to enhance the adhesion and/or increase the surface temperature of a substrate. Primers are not intended as a **substitute** for a properly prepared surface. Primers are recommended, but not required. Whose responsibility is it when you loose adhesion to the substrate? (contractor, mfg., designer)

❑ Vapor Retarders

Determining the need for a vapor retarder, its compatibility with other materials and the details of its construction is the responsibility of the designer.

❑ Separation Layer; Can be insulations boards or Base Sheets

- A separation layer, typically either an insulation cover board or asphalt base sheet, is often installed over certain structural roof decks or other substrates to provide a physical separation between an SPF-based roof system and substrate. An example is an insulation cover board installed over irregular or uneven substrates, such as a metal roof deck or a precast concrete plank roof deck, to provide a smooth surface to which an SPF-based roof system can be applied.
- Can you adhere two different insulation types to each other? One consideration;
- EPS/XPS-SPF? Dimensional stability differences between these two types suggest you need a separation layer
- ISO-SPF? Dimensional stability of these two relatively close and would expect to move at the same rate.

Daily Quality Assurance Report-Foam

Some owners go to great lengths to insure QA

DAY'S ACTIVITIES	Crew Started: Unk.	Crew Finished: Unk.	Crew Size: 6	Observer Arr: 7:45 am Left: 8:45 am
Weather: Sunny		Temp: 61º		
Wind Speed: Clam	Humidity: 47%	Dew Point: 40º		
SCHEDULE	Roof Completed Today: (20%)	Total Roof Area Complete w/o Surfacing: (80%)	Total Roof Completed (75%)	

CHECK LIST: Project Document Compliance KEY: C=Compliance V =Variation Blank=Not Applicable

	C	V		C	V		C	V		C	V
Decking	X		Dens-Deck/walls	X		Insulation		X	Foam	X	
Base Coat	X		Granule Coat			Top Coat			Material Storage		X
Equipment	X										

WORK DESCRIPTION:

At the time of inspection, Contractor was mechanically fastening two layers of the polyisocyanurate insulation board and building the cricket taper package. Spray foam application to take place later in the day. A base application of acrylic coating has been applied to the newly installed spray foam.

ACTIONS REQUIRED:

- ***Core sample requirements for compressive strength and density. Test procedures used were ASTM D 1621 and ASTM D 1622.***

Daily Quality Assurance Report-Foam
Some owners go to great lengths to insure QA

Will an owner have confidence with this substrate prep

Typical view of fastening pattern. In compliance with approved submittals.

Daily Quality Assurance Report-Foam
Some owners go to great lengths to insure QA

2		View of taper package that was being installed at the time of inspection. In compliance with approved submittals.		View of probe showing required 2" application of spray foam. Multiple areas were tested with the depth gauge and all were in compliance. ***In Compliance***
3		View of insulation board that has a gap greater than ½" ***Not In Compliance***		View of core sample #2 Core #2 Compression test result – 70 psi. Core #2 sample in place density test – 5.33

SPRAY POLYURETHANE FOAM ALLIANCE

Daily Quality Assurance Report-Foam
Some owners go to great lengths to insure QA

View of core sample #1

Core #1 Compression test result – 60 psi.

Core #1 sample in place density test – 4.43

View of slit sample taken from the section that had base coating application applied.

Slit sampled was measured with an optical comparator. Sample measured at 15 mil DFT and is in compliance with industry standards for a base coating.

SPRAY POLYURETHANE FOAM ALLIANCE

Existing roof substrates;
Some owners work directly with contractors to insure QA

- Existing ballasted EPDM Roof.
- Prep;

There is no ballast, nice smooth surface

There are additional fasteners, are they adequate

Was there a designer involved

Is it clean or properly prepared

Where does the owner turn if there

are problems with this roof?

Industry best practices; Re-roof/recover over existing

- Here, the owner of a large mfg. plant (90,000 sq/ft.) contracted with a reputable applicator to install an SPF system over BURG system. The applicator sprayed right over the expansion joints, years into the warranty, the SPF cracked and caused leaks into the building.
- Do you find this detail in the SPFA/NRCA best practices manual?
- Who is responsible for the repair cost?

Industry best practices; Re-roof/recover over existing

- The same applicator sprayed directly to the coping metal (8” above roof level) incorporating the metal into the roof system.
- Is coping metal secured the same as “edge metal”
- Who is responsible for the repair cost?

Costs involved when concerns start to arise
Mobilization costs of a “foam rig” versus a Maintenance vehicle

- A typical SPF roof rig set-up can cost up to $150-200K
  - A trailer/truck rig with Graco H-40 and 833 coating rig alone can run up to $100K, then you may have up to $60K for a 1-ton pickup or truck.
  - Contractors may charge $500-800 fee just to mobilize this piece of equipment.
  - Comes with a crew of 3 or 4 members, materials and labor are more expensive
  - IF the repair is not covered under the warranty, then the owner/contractor will have to cover the costs of mobilization, either way, there is a cost for the service.
- Maintenance vehicles are more reasonable,
  - maybe $50K for a ¾-ton pickup and ladder set-up may have a lower mobilization fee maybe $100-200, or no mobilization fee.
  - Comes with 2 crew members to perform sealant/coating repairs that are less expensive

Once the roof has been installed, its time for a; PREVENTATIVE MAINTENANCE Program

- Under tough economic pressures and uncertainty, it is imperative for property owners and managers to spend their monies wisely and manage their facilities assets properly. The ultimate goal should be to achieve maximum roof service life at the least possible cost. For this reason, roof maintenance – in conjunction with modern life-cycle assessment techniques – has never been more Appropriate.
- Maintenance programs are available for existing roof systems after a thorough audit by a professional roofing contractor. Industry studies show that a proactive maintenance program can lower the average life-cycle cost of a roof to $0.14 per square foot.

PM Program will increase life expectancy

- An “out of sight, out of mind” attitude toward roofing systems is dangerous. It is also poor asset mgmt.
- Many building owners/managers don’t think about their roof until it leaks. By that time, minimal damages turn into moderate repairs to the system, and sometime removal of areas that were allowed to fester. A roof can leak for days, weeks or months before it is noticed inside the building (depending upon insulation below to roof)

PM Program will increase life expectancy

- A few facts; 10 years ago, a survey indicated;
  - More than 80% of all roofs are replaced prematurely “lack of PM program’
  - Average cost of commercial roof was $4.25, now more likely $6.50 sq. ft. and rising.
  - Repairs, maintenance and/or restoration cost thousands of dollars less then replacement
  - Roof maintenance programs typically cost about 1% to 3% per year of the estimated total replacement cost

PM Program will increase life expectancy

- So, when a “tree” is growing thru the roof system, who is responsible for maintenance?

What does a PM program look like?

- Assume you are starting out with a good roofing installation
  - the goal is to start immediately, from year 1, take a preventative program to ensure maximum service life of this roof.
  - Maintenance is the responsibility of ownership. It is required in most roofing mfg. warranties.
  - Most commercial contractors offer maintenance services. When taken seriously, most have dedicated maintenance divisions run by their most experienced roofers.
  - The simple components of a PM package should consist of;
    - Visual roof inspection, including a 50-point regimen.
    - Photographic, digital and written documentation of roof conditions
    - Proposal for recommended work, and repairs for deficient conditions
    - Routine maintenance as needed.
  - Maintenance programs are also available for existing roof systems after a thorough roof audit is conducted.
- Industry studies show that proactive PM programs can lower the average life-cycle cost of a roof to $0.14 per sq. ft. A reactive program (when a contractor is called after problems are discovered) can cost up to $0.25 per sq. foot.
- Studies show that roofs with proactive programs can last up to 21 years, compared to only 13 years with a reactive program.
- Conclusion; property owners should adopt a PROACTIVE roof maintenance protocol to receive the maximum service life of their system, and reduce the collateral damage caused by leaking roofs.