



# **Understanding new Acceptance Criteria of Alternative Assemblies Thermal and Ignition Barriers over SPF**

# Why do we need to cover the SPF

- Spray Polyurethane Foam (SPF) is **combustible**
- As the SPF burns and heats up flammable gases and thick smoke are produced, these gases can ignite causing a **flashover**
- The International Building Code (IBC) mandates that SPF be separated from the **occupied** interior of the building by a 15 minute **thermal barrier**, or other Alternate approved covering.
- Building codes allow an exception to the thermal barrier in **unoccupied** attics or crawlspaces where entry is solely for the purpose of servicing or maintaining utilities. In this case an **Ignition Barrier** only is required.



# Thermal Barrier test method for alternative assembly testing

- For **Alternative Thermal Barrier** applications the coating and the SPF must be tested to **NFPA 286** (or equivalent), as a system.
- Test is run in a **Full Scale Room** configuration with an **ignition source** in one corner.
- Test is run for **15 minutes** with the first **5 minutes** at a heat output of **40 kW** and a further **10 minutes** at **160 Kw**.
- Assembly must be able to **prevent flashover, slow the spread of fire, reduce the amount of smoke generated and eliminate the heat** contributed if the foam was to burn



# Running Full Scale Testing is NO LONGER ENOUGH

- Alternative Thermal Barriers are tested as assemblies.
- $A + B = C$
- While A & C ( SPF and the Assembly) were defined, B the coating was not held to a burden of proof of quality assurance or manufacturing consistency via 3<sup>rd</sup> party listings and inspections.

# AC456 is a New ICC-ES Criteria for Coatings over SPF ensuring the product tested, is what is used on job site application.

- AC377 establishes requirements for *spray-applied foam plastic* insulation
- Prior to the AC456 there were no quality assurance requirements for the fire protective coating
- Effective October 2017 ALL testing that was not run in accordance with AC85 Section 3.1 will be removed from ALL SPF evaluation reports
- AC 456: Why is this a win for the SPF industry?

# What does AC456 include.....

- maintain a third party quality assurance and follow up inspection program.
- Testing must be carried out by an ISO/IEC 17025 accredited facility
- Coating must carry an Evaluation report
- Coating shipped must include an inspection mark
- Coating manufactures can now list SPF manufactures on their report.
- Standardizes fire protective coating application rates and thickness measurement techniques

# Third Party Listed Quality Assurance allows a more streamlined acceptance and approval process

- Product **certification** provides a tangible measure of assurance to inspectors and **AHJ's** that products meet applicable regulatory requirements.
- Certification Marks are recognized by Authorities Having Jurisdiction (AHJs) including building code officials, fire marshals, and inspectors across North America;



- Provides independent documentation to the AHJ and end user that verifies the fire protective coating manufacturing procedures provide a product consistent to that which was tested.
- Code Officials, AHJ's and end users have no patience for safety and assurances.

## Ensuring Code Compliance

- Ignition Barriers tests, CANNOT be used as a Thermal Barrier, however a Thermal Barrier also performs as the Ignition Barrier.
- The **specific brand and type of SPF** must be tested as a system
- SPF must be installed at the maximum thickness for which certification is sought
- Check the evaluation report, for the brand and type of foam you are applying for coating thickness.

## Assemble a “code and job package” for each project.

- Obtain a test or Evaluation Report for correct system.
- Job Work Record
- Medallions
- Job Site Labels
- SDS
- Application guide
- Ventilation guide



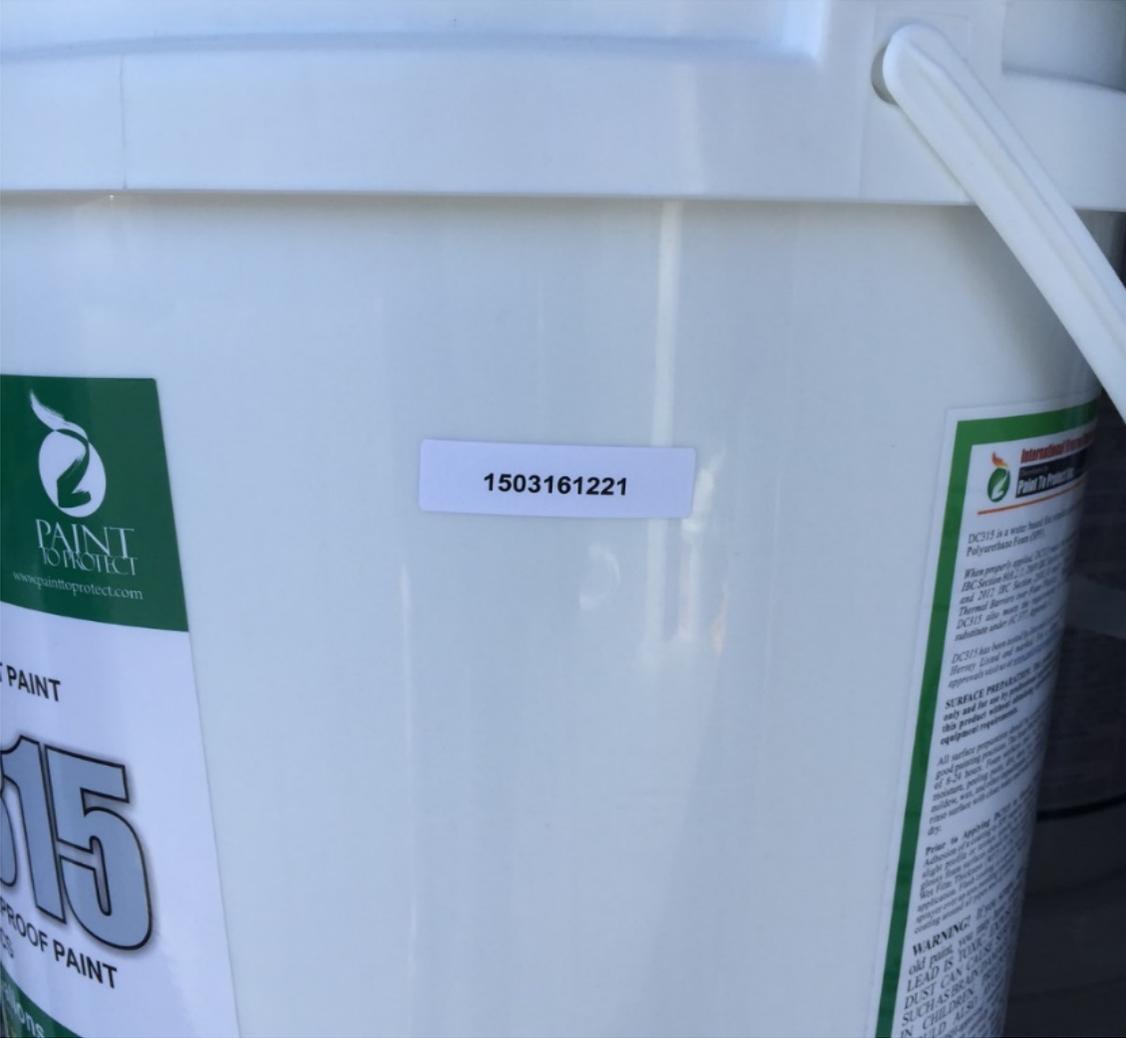
# Benefits of Becoming a Certified Applicator

- Applicator **certification** shows extensive due diligence and education on your part as the applicator.

Non-compliance **Costs**



# Importance of Date Codes and Batch Numbering required in AC456



# Environmental Conditions for applying coatings

- **Temperature**
- **Do Not** store on concrete floors during winter months.
- **Humidity:** Relative humidity plays an important role
- **Ideal conditions are 50-65% relative humidity.**

# Humidity

- Curing times are significantly affected when humidity levels exceed 70%.
- Low relative humidity can also be a problem, because coatings may dry too quickly and lead to blistering on the surface.
- Be aware when installing coatings in large projects that require multiple days ensure there is sufficient ventilation during the “off” hours when the project is closed EG; over the weekend.



## Dew point

- **DELTA (DIFFERENCE) BETWEEN DEW POINT AND SURFACE TEMPERATURES**
- The Dew point is the temperature that water vapour will become liquid water.
- Documents such as ASTM D3276 and the international standard ISO 8502-42 state that the surface temperature must be a minimum of **5°F (3°C) above the dew-point** temperature during the critical 3 phases of coating: preparation, application and cure.

# Air Exchange and Ventilation

- We recommend running fans to circulate the air during application, especially in high or low humidity. Air flows must be across the area coating was applied, but not directly on it.
- If the relative humidity is **greater than 75% at the end** of spraying and cross ventilation is not drastically reducing it, then a **mechanical industrial dehumidifier is required**.
- Maintain at least **0.3 air changes** per hour following application until coating has fully cured.



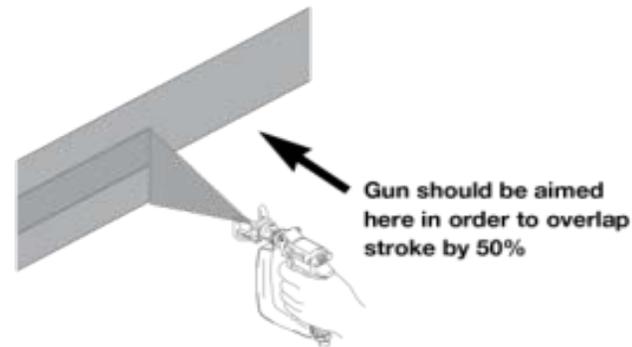
# Maintain Temperature until product is fully cured

- **Freezing:** It is important that air temperatures do not drop below 50° F in the work space until the coating has fully cured, minimum of 72 hours.
- Be sure to **monitor temperature and humidity levels for the duration of the install.**
- The use of space heaters may be required during colder times of the year.
- If space heaters are required **DO NOT USE combustion style heaters**, commonly referred to as “Salamanders”, these types of heaters will add a significant amount of moisture to the air and will impact negatively on the curing coating.



# Spray Technique

- Spray technique should include an “**overlap**” technique where each spray pass is overlapped **50%** for uniform coverage. Check applied film thickness using a wet mil gauge.



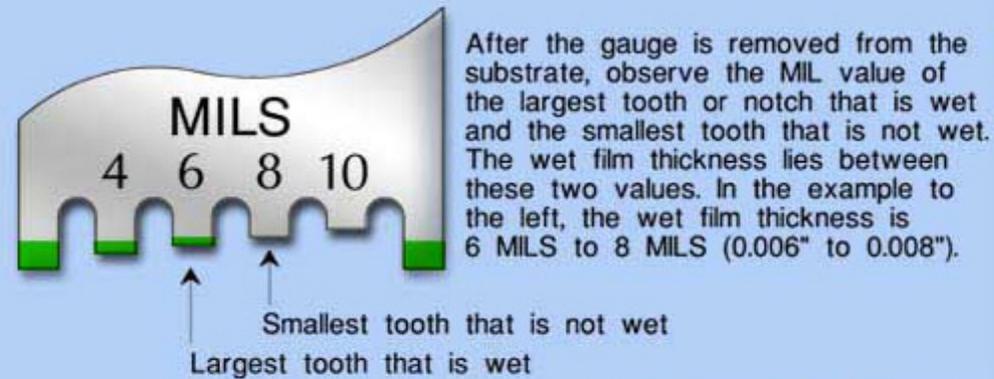
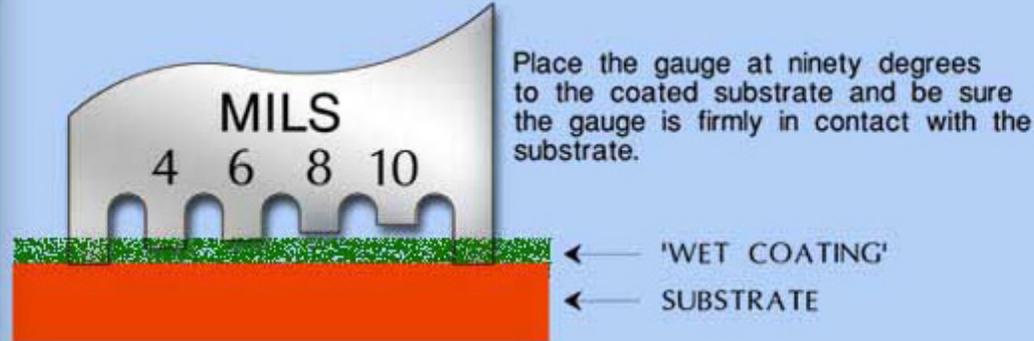
- The applicator should spray with an “X” out technique, **2 light passes at once (wet on wet)** with one pass **side to side** and the next pass **up and down**. This technique helps to ensure a uniform coverage over the sometimes uneven surface of the SPF. Passes should not be confused with coats which require 4 hour dry time in between as opposed to a wet on wet pass.

# WFT versus DFT

- In order to ensure the coating will perform as tested the applicator needs to ensure the required thickness of material is applied.
- Wet Film Thickness (**WFT**) is a measurement of the coating that has just been installed while it is still **wet**.
- Dry Film Thickness (**DFT**) is a measurement of the **dry** and cured material.
- The DFT is a direct relationship to percent solids of the material you are applying.
- **DFT = WFT X % Solids**, so for a 67% solids material with a WFT of 18 mils X .67 would =12.06 DFT.
- A **WFT gauge** is designed to give the spray applicator immediate mil measurement of the film build that has just been sprayed.
- There are several types of WFT gauges available. The most common is the notch gauge (see figure 1).
- Other types of gauges available from specialty vendors include the eccentric disk, rolling notch, and the 6 sided.



## HOW TO USE A 'WET FILM THICKNESS GAUGE'



Wet Film Thickness is greater than 6 MILS (0.006")  
and less than 8 MILS (0.008")

\* Drawings magnified and stretched for clarity, not to scale.

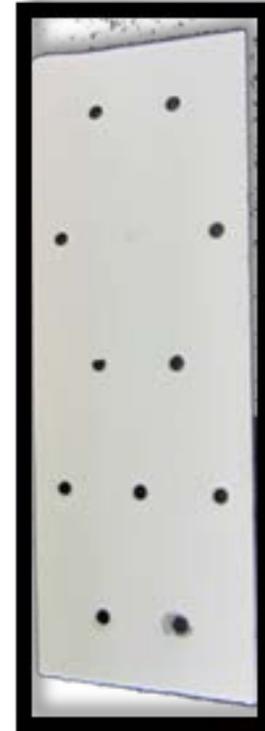
# Using Medallions to Document the Install and Verify Thickness of the Coating

- Write the job date, applicator name and the Wet Film target on the back of each plate.
- Install **metal plates** throughout the surface of the foam. (These plates are available at most hardware stores).
- Measuring WFT on the front side of the plate will give the most accurate reading
- Collect these plates and keep them on file. They are a great tool to present your code official or Fire Marshal.
- These plates allow for future verification of the Dry Film Thickness (DFT) using electronic or magnetic measuring tools.



## Medallions can be purchased at most hardware stores

- **Mending Plates**
- Model # TP15
- UPC #  
031107654803
- Available at home depot or search on line retailers.



# Job Work Records and Labels



- **Job Work Records** are an excellent way to document your installation and helps to **show compliance** with the recommended installation parameters and test reports.
- Job work records should be completed for each job that you install a fire protective coating.
- Complete **Job Label** and stick to electrical panel

## Thermal Barrier Installation Job Work Record

Job Work Records are an excellent way to track your installations and confirm compliance to your Building Official or Authority Having Jurisdiction. In the event of a concern on a job the installer is able to provide documented proof of the installation, for this reason IFTI recommends using these forms for all thermal barrier jobs.

Contractor:		Application Start Date:		Completion Date: (M/D/Y)			
Contact Info:		Installer Name:					
Application guide on jobsite: Yes No (Circle One)							
<b>PROJECT INFORMATION</b>							
Customer Name:		Occupied:		Unoccupied:			
Job Site Address:		Warning Signs Posted:		Yes No (Circle One)			
		Building Permit #:					
		Spray Area Isolated:		Yes No (Circle One)			
Scope of Job:		Ventilated at 0.3 ACH:		N/A Yes (Circle One)			
		Coating Thickness Required:					
		WFT:		DFT:			
<b>DC 315 THERMAL BARRIER MATERIAL INFORMATION</b>							
Brand and Type of Foam Used:		DC 315 Batch #'s:					
Mix Time per Bucket: mins		Material Temp: F C					
Quantity Used: Gals:		# of Passes:					
<b>EQUIPMENT INFORMATION</b>							
Airless Sprayer:		Hose Length: F M		Hose Diameter:			
Pressure:		Tip Size:					
Gun Type:		Other:					
<b>SUBSTRATE CONDITIONS</b>							
Type:		Clean:		Texture:			
Free of Grease/Oil: Y N		Dry:		Wet:			
Special Preparation:		All Areas of Foam With A Glossy or Smooth Finish Must Be Primed or Misted with Foam Prior To Applying DC315.					
Was Primer Used: Yes No Type:							
<b>ENVIRONMENTAL CONDITIONS</b>							
Ambient Temp: F C (Circle one)		Substrate Temp: F C (Circle One)					
Type of Ventilation:		Ventilation Duration: hrs:		days:			
Heating Required: Yes No N/A		Type Of Heat:					
<b>Site Testing</b>							
Thickness Required: (mils WFT) Were Medallions Used: Yes No		Daily Temp and Humidity Readings: C F (Circle One)					
Record Actual WFT measurements below. Minimum 1 per 400 sq. ft.		Day	Temp	RH%	Day	Temp	RH%
1	7	13	19		7		
2	8	14	20		8		
3	9	15	21		9		
4	10	16	22		10		
5	11	17	23		11		
6	12	18	24		12		
For Projects Greater Than 10,000 Sq Ft Please use Additional Work Reports							
Date:		Installer Signature:					
Job Work Record Should be Filled Out For Each and Every Job. Completed Work Records Must be Submitted To workrecord@painttoprotect.com Within 10 Days of Job Completion.							

## Upon Completion of Applying the Coating

- Be sure to re-check **Temperature and Humidity** and document on **job work record**
- If environmental conditions are outside recommended parameters refer to your manufacturers Ventilation Guide for appropriate steps
- Gather Medallions, ensure job name, date and measured WFT are on the back. Keep on file with other site documents for future reference and verification
- Complete job site label and attach to electrical panel for easy verification by the AHJ

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**THANK YOU!!**