



# Through-Wall Flashing Compatibility, Sustainability and Performance

Craig Wetmore, CSI



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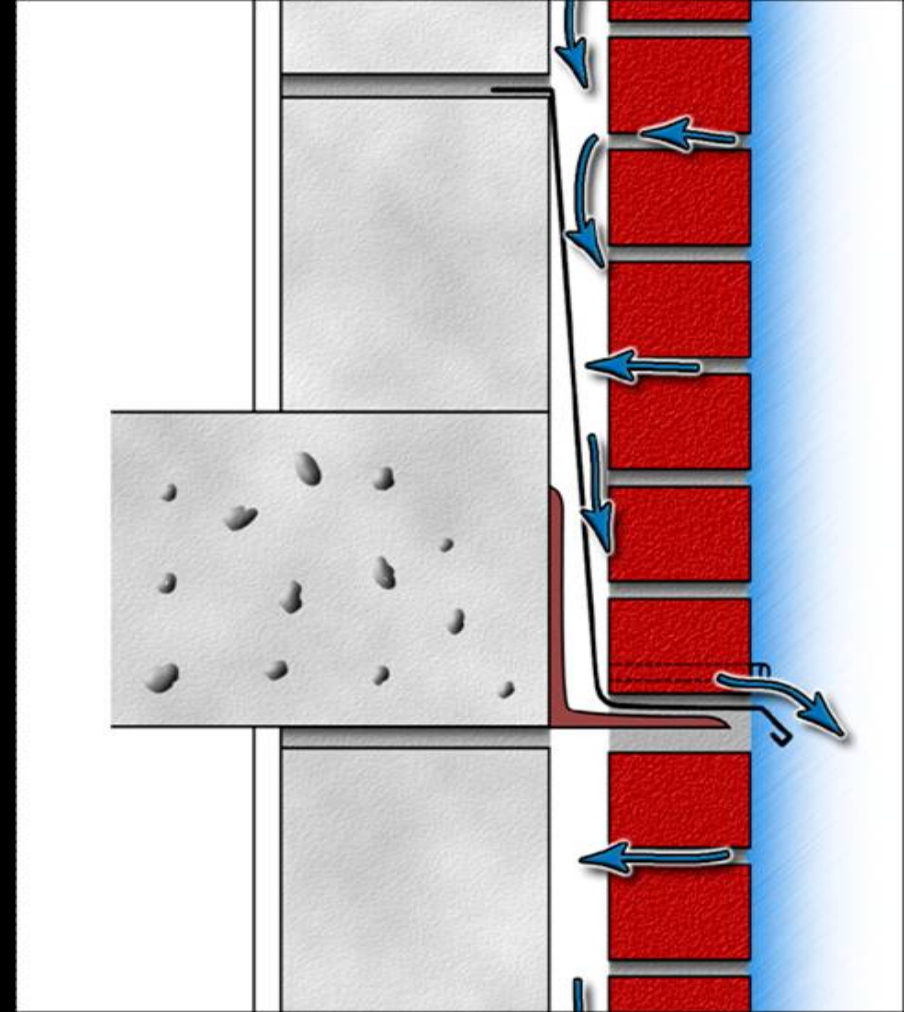
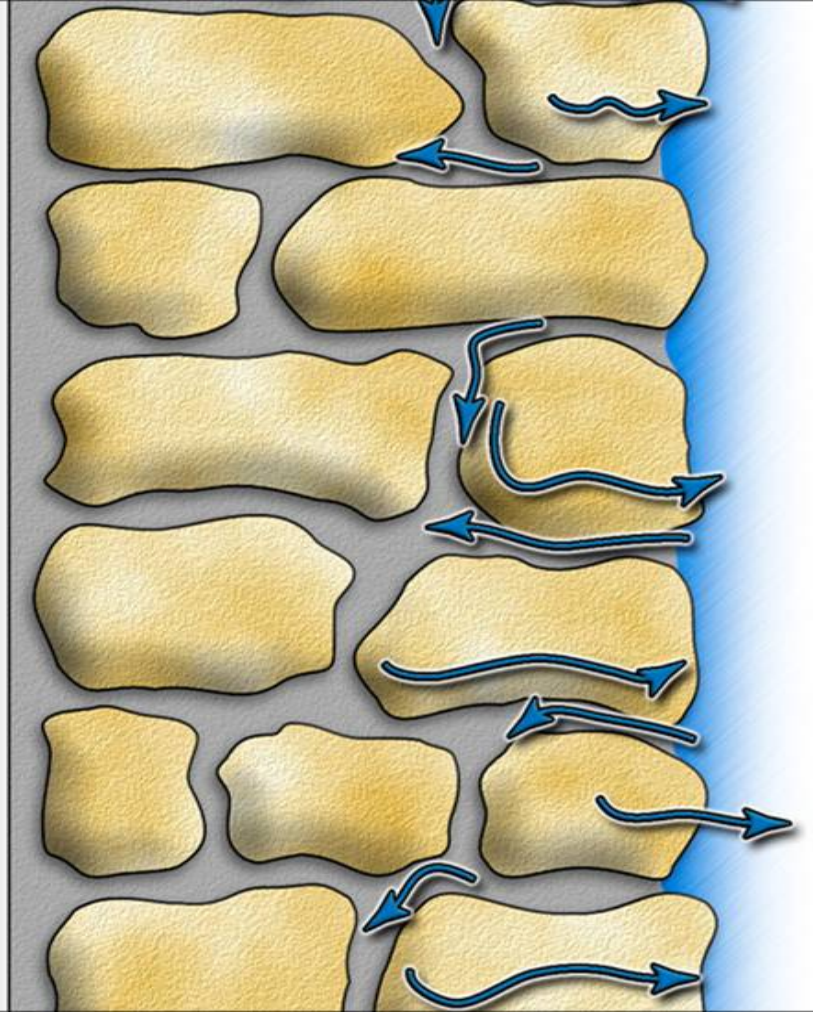
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**Course #0090005315**

The logo for GBCI CMP is located in the bottom right corner. It consists of a white rectangular box with a grey drop shadow. Inside the box, the text "GBCI" is written in a bold, green, sans-serif font, and "CMP" is written below it in a bold, grey, sans-serif font.

**GBCI  
CMP**

# *Through-Wall Flashings*





# ***Learning Objectives***

- **Understand the purpose of through-wall flashing**
- **Performance criteria used to specify through-wall flashings**
- **Understand the attributes of commonly used flashing materials**
- **Understand compatibility issues between cavity wall components**

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SCAFFOLDING**  
100 MILL STREET  
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# ***Design Attributes of Flashing*** **Masonry Advisory Council**

- **Water imperviousness**
- **Resistant to damage during construction**
  - **Puncture, Tear, Sunlight (UV) and Burn**
- **Should not cause discoloration of the brickwork**
- **Be compatible with adjoining adhesives and sealants (and everything else it contacts)**
- **Life expectancy of the flashing matches the structures anticipated life of the building**

## ***Masonry Advisory Council***

**“ Due to the prohibitive cost of replacement, flashing is one construction material that should never be selected solely for having the lowest installed cost”**





## ***Best Practices***

- Do your product research
- Take an informed position
- Be specific with your material selection..
  - Must match the lifespan of your structure
- Value Engineering:

***Be ready, willing and able  
to defend your position!***



# *Cavity Wall Components*



# *Cavity Wall Components*

## **Air Barriers:**

### **– Required by:**

- **ASHRAE 90.1-2010 (Sept. 2010)**
  - **LEED v.4 (November of 2013)**
  - **ANSI/USGBC/IES Standard 189.1 - 2011**
  - **IgCC, IECC 2012**

### **– Types**

- **Liquid Applied: Asphalt, Acrylic, Silicone, etc...**
- **Membrane: Asphalt, Butyl**
- **Spray Polyurethane Foam**
- **Building Wraps/Papers**



# *Cavity Wall Components*



## Insulations:

- Polystyrene, Polyisocyanurate, Spray Polyurethane Foam

## Sealants:

- Mastic, Emulsion Mastic, Butyl, Polyether, Polyurethane, Silicones

## Tapes:

- Asphalt, Butyl

# *Through-Wall Flashings*

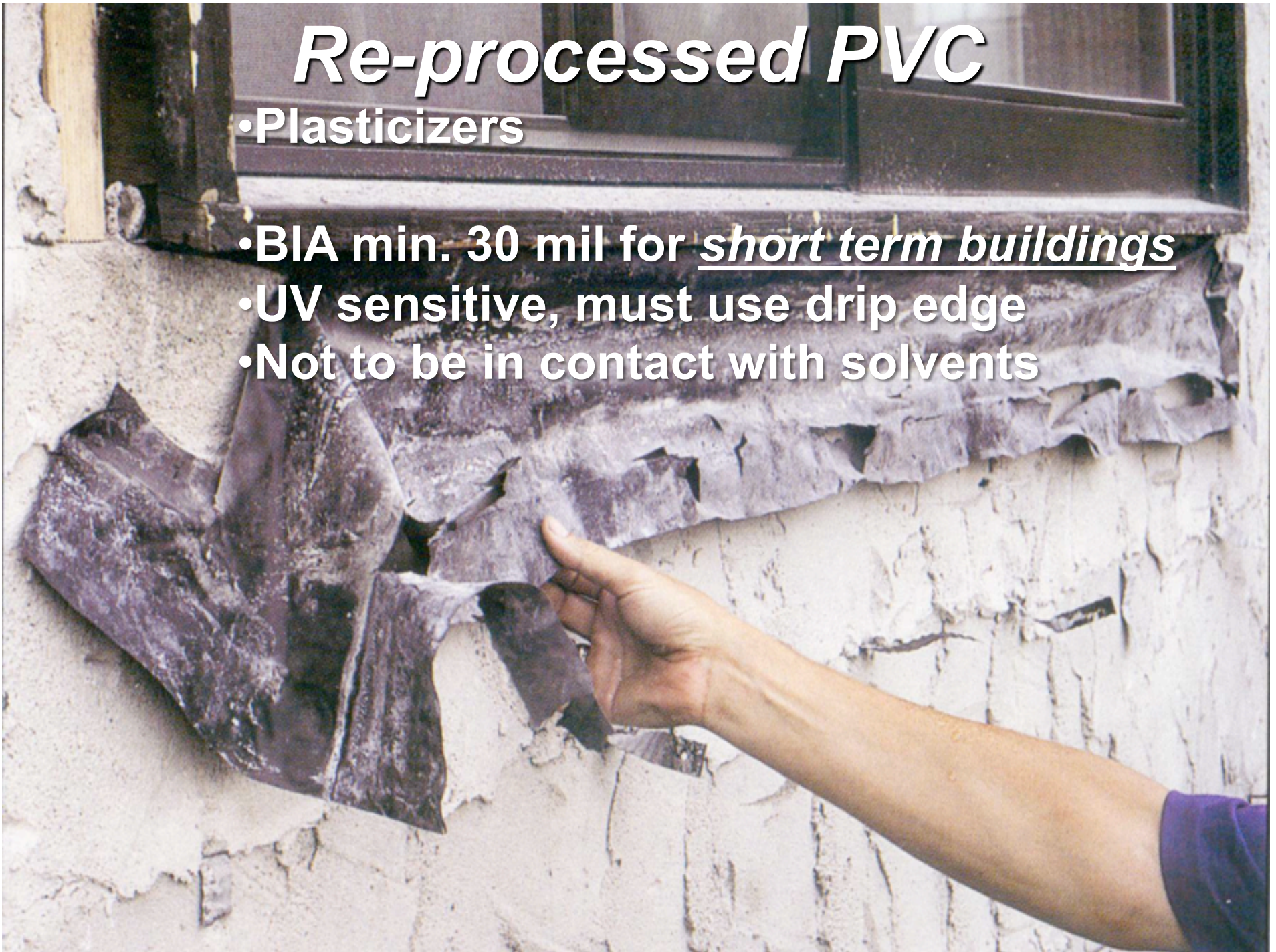
- Plastics (PVC)
- Self-Adhesive Rubberized Asphalt (Peel-&-Stick)
- EPDM
- Laminated Metals



# ***PVC Flashings***

# *Re-processed PVC*

- Plasticizers
- BIA min. 30 mil for short term buildings
- UV sensitive, must use drip edge
- Not to be in contact with solvents



# *Peel & Stick Flashings*

# Peel & Stick

8 MILS

Cross Laminated Polyethylene Sheet  
with a 30 Day UV Exposure Limit  
(The Workhorse of the Total Product)

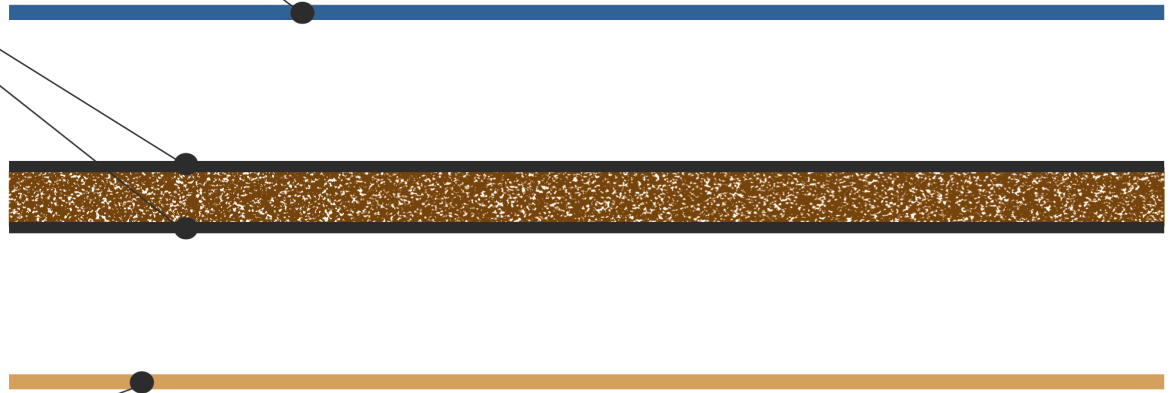
4 MILS (Each Side)

APP or SBS Polymer Enhanced  
Asphalt for Adhesion

24 MILS

Emulsion of Asphalt  
Containing various organic  
fillers (clay/dirt) to build bulk

PCK or Polypropylene  
Release Sheet





# *Peel & Stick*

- Spanning a gap
  - Cannot span a gap of 1/4" or more
  - Gaps must be reinforced
- Prime exterior surfaces
- Install termination bars
- UV Sensitive (30 day)
- Confirm asphalt compatibility with neighboring materials



## ***BIA Tech Note #7***

- Select flashing that is waterproof, durable, UV resistant and compatible with adjacent materials
- Use a metal drip edge to extend flashings that degrade when exposed to UV light



***EPDM***

ETHYLENE-PROPYLENE-DIENE MONOMER

# EPDM

- Thermoset rubber
- Well known roof material
- Multiple component installation
- BIA Tech Note 7
  - Dimensional stability may be a concern
  - 2% shrink acceptable per ASTM D1204
- Cannot span a gap +1/4”
- Compatibility issues
  - Asphalt (air barriers/damp proofing)
  - Oils/Solvents (mastics/spray foams)
  - Talc must be cleaned off



# Heat Issues with SPF



- **Synthetic materials**
  - Rubberized Asphalt (Peel & Stick)
  - PVC's

***Copper and  
Stainless Steel  
Fabric Flashings***

# *Copper Flashings*

- Copper Fabric Flashing Two Types:
  - Asphaltic (circa 1935)
  - Non-Asphaltic (circa 2004)
- Drainage Plane Flashing
- Copper Tex (Paper)
- Copper Seal (Asphalt Only)



# Copper = Longevity

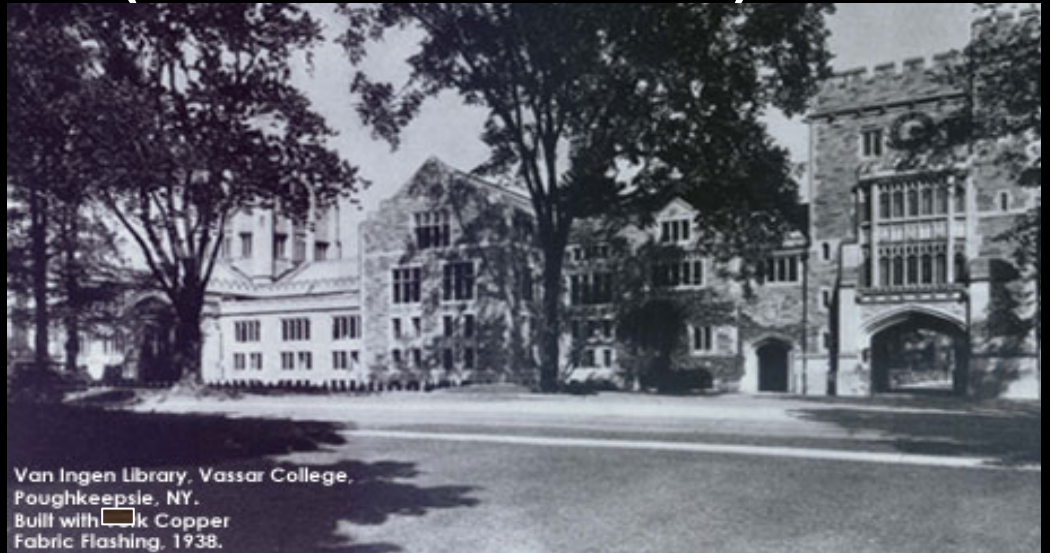




# *Copper Fabric Flashing*

## *Asphaltic*

- **Asphaltic Copper covered in Mica Dust**
  - Not compatible with air barriers
  - Not compatible with polyurethane spray foam insulation
  - Not compatible with polystyrene insulation
  - Sealant choice: mastic (20%-40% solvents)
  - Drip edge required



# *Copper Fabric Flashing*

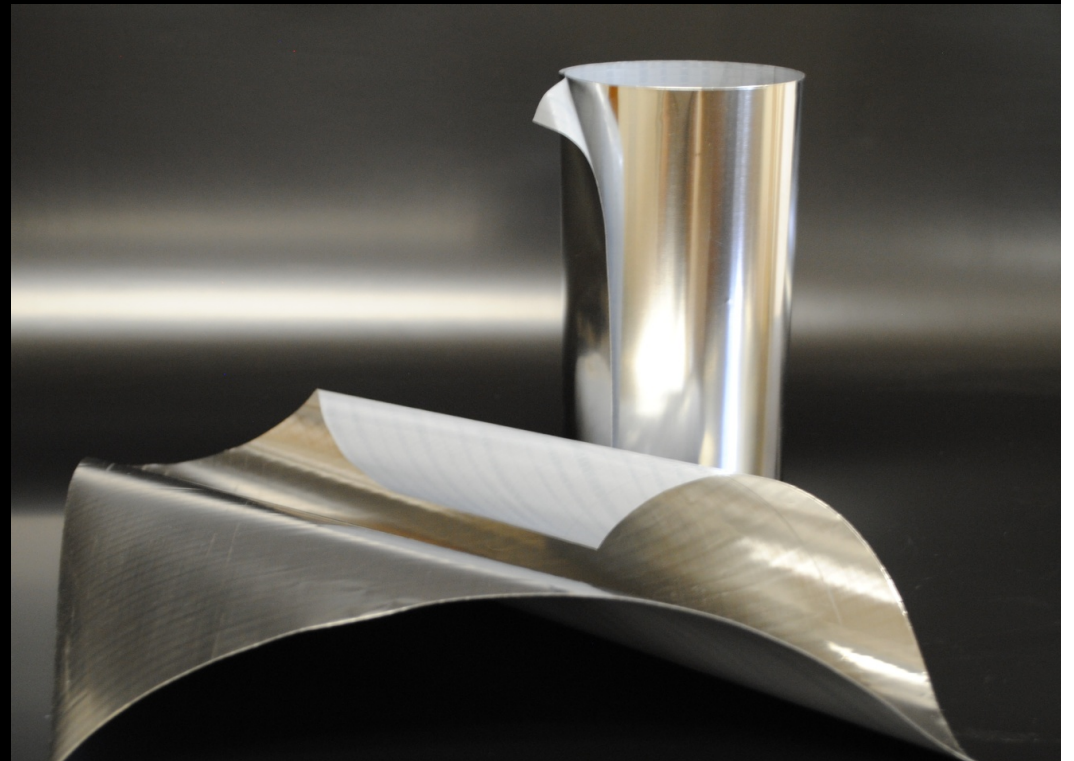
## **Non-Asphaltic**

- Stronger than synthetic flashings
- Longer rolls for less laps
- Compatible with:
  - Air barriers
  - Sealants
  - Insulations
- Color coded



# ***Stainless Steel Fabric Flashing***

- A full single sheet of 304 stainless steel
- Air barriers and sealants easily adhere to
- Dramatically tougher to puncture than copper
- Easy to form by hand
- Can span a gap
- Fire resistant

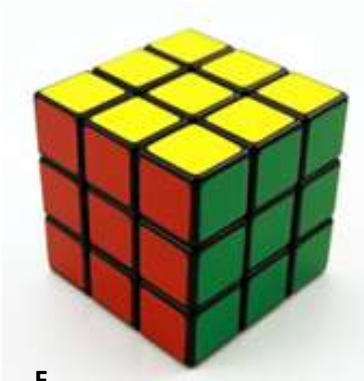




# *ARE THEY GREEN?*

	<u>Max Recycled Content</u>	<u>Recyclable</u>	<u>Maximum Warranty</u>
PVC	80%	Yes	5 years
Peel & Stick	1%	No	5 years
EPDM	3%	No	10 years
Copper	90%	Yes	Lifetime
Stainless Steel	60%	Yes	Lifetime

# Are They Compatible?



## AIR BARRIERS & INSULATIONS

		Spray Polyurethane Foam	Liquid Applied Asphaltic Air Barrier	Liquid Applied Acrylic Air Barrier	Membrane Applied Asphaltic Air Barrier	Polystyrene Foam Insulation	Maximum Warranty
<b>F</b>							
<b>L</b>	Asphaltic copper fabric						None
<b>A</b>	Non-asphaltic copper fabric						Lifetime
<b>S</b>	Stainless Steel fabric						Lifetime
<b>H</b>	Copper Drainage Plane						Lifetime
<b>I</b>	EPDM						10 years
<b>N</b>	PVC						5 years
<b>G</b>	PVC KEE Self Adhered						10 years
<b>S</b>	Peel & Stick						5 years



**SPECIFIER'S NOTE:** ALL MANUFACTURERS OF AIR BARRIER, INSULATION, SEALANT AND FLASHING PRODUCTS SHOULD PROVIDE LETTERS OF COMPATIBILITY FOR THESE PRODUCTS IN COMBINATION WITH EACH OTHER

\* Provider of this program has letters of compatibility on CD available for you.

# NFPA 285 & IBC Chapter 26

## Insulations and Water Resistant Barriers

- The International Building Code (IBC) in 2006 required that all wall assemblies containing plastic foam insulation products pass the NFPA 285 requirements. The 2012 version extended beyond the insulation products to include all combustible weather barriers, which include through-wall flashings. The IBC does not define combustible, so the general interpretation is that anything that is ***not specifically proven to be non-combustible is considered to be combustible***.

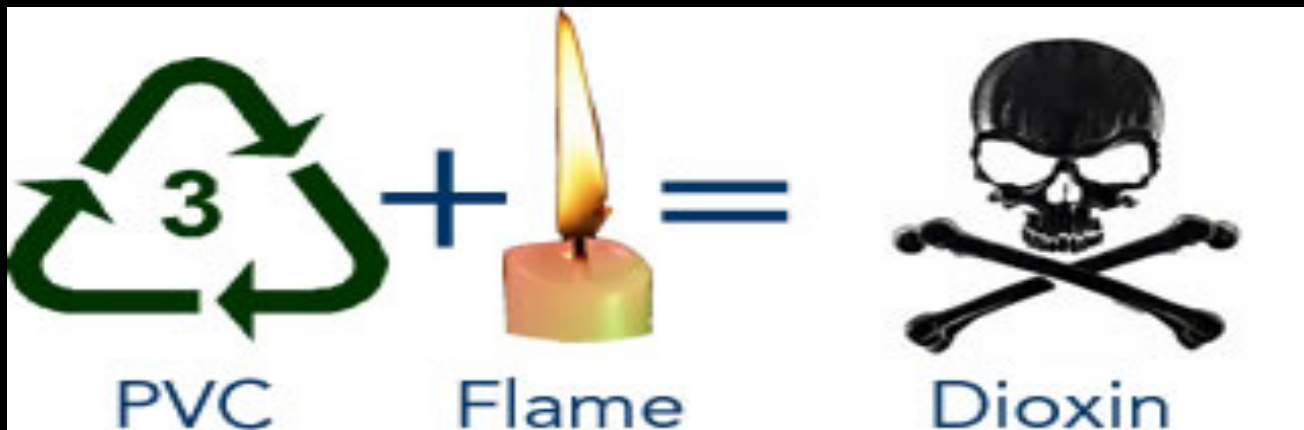
### What this means to the industry:

- With ASHRAE 90.1 leading the way and all of the organizations (IBC, IgCC, IECC, and USGBC's LEED) insisting on better energy efficiency, we are going to have insulation in all of our cavity walls soon.
- NFPA 285 will be required for these walls (the significant changes for 2012 stated above). To date:
  - No asphalt based air barrier has passed the NFPA 285 test
  - No rubberized asphalt (Peel & Stick) flashing has passed ASTM E84
  - In light of the NFPA 285 tests, flashing is becoming a major issue and investigated more closely



# NFPA 285

- When burned, PVC produces carbon monoxide, dioxins, and chlorinated furans. Dioxins and furans are two of the most toxic man-made products because the lowest amount of either product can cause diseases such as, cancer and birth defects. Burning PVC can also cause hydrochloric acid in your lungs and cause possible ulceration of your respiratory tract.
- The hydrochloric acid formed when PVC is burned, can lead to life threatening lung damage and causes serious corrosion to buildings.





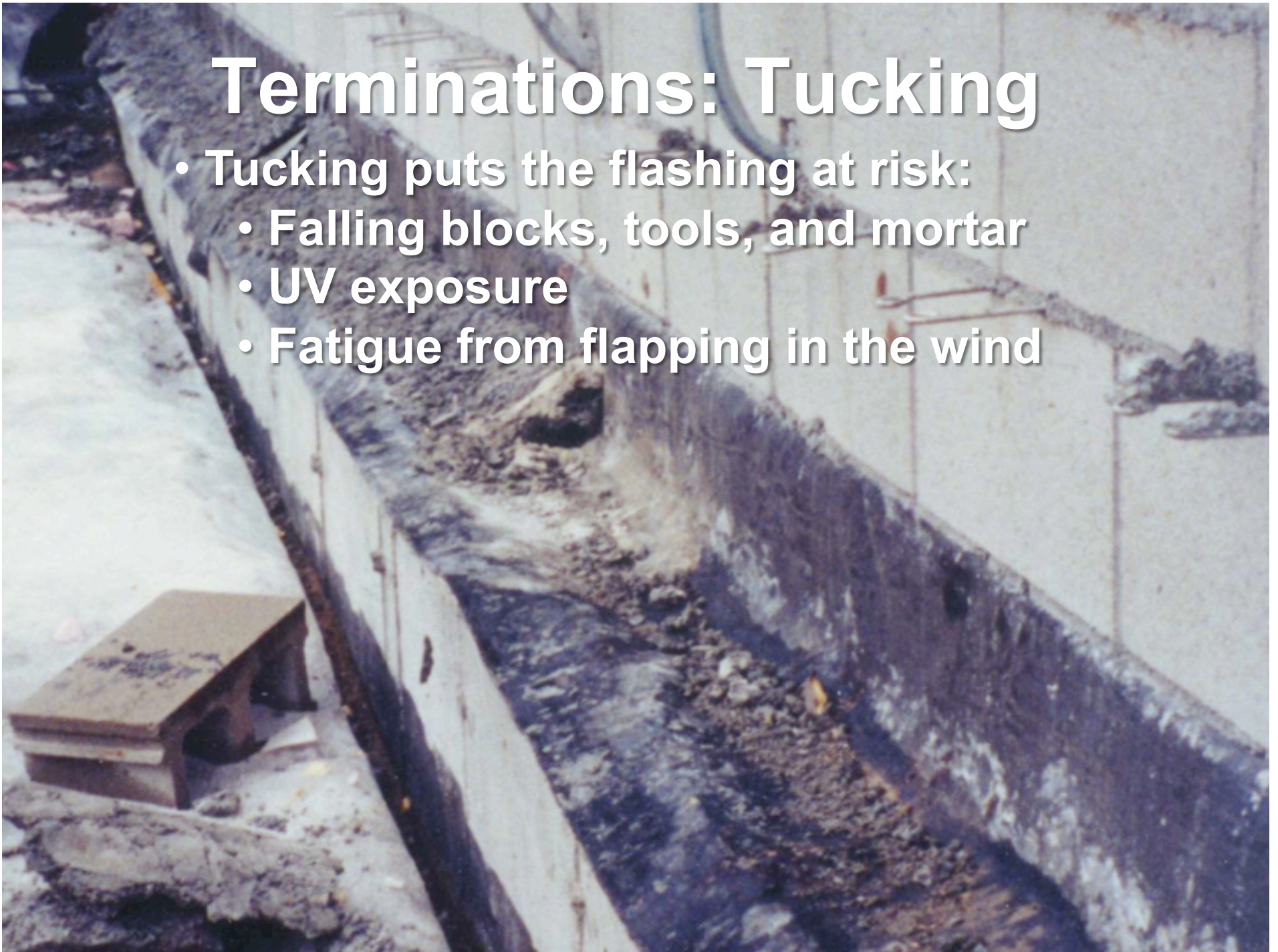
## ***Accessories***

- **Termination Methods**
- **Sealants**
- **End Dams**
- **Corners**
- **Mortar Deflection**
- **Weep Devices**



# Terminations: Tucking

- Tucking puts the flashing at risk:
  - Falling blocks, tools, and mortar
  - UV exposure
  - Fatigue from flapping in the wind



# *Termination Bars*

- **Materials:**
  - Stainless Steel
  - Aluminum
  - Plastic/PVC



# *Termination Clamp*



- **Installs in the backer wall**
- **Minimizes flashings exposure**
- **Compared to termination bar**
  - **Less dependent on sealant**
  - **Quicker and easier to install**



# Sealants

- Chemical compatibility with all components

- » Get it in writing

**Polyurethanes: no contact with asphalt**

- » Air barriers, tapes, flashings, underlayments, roofing materials

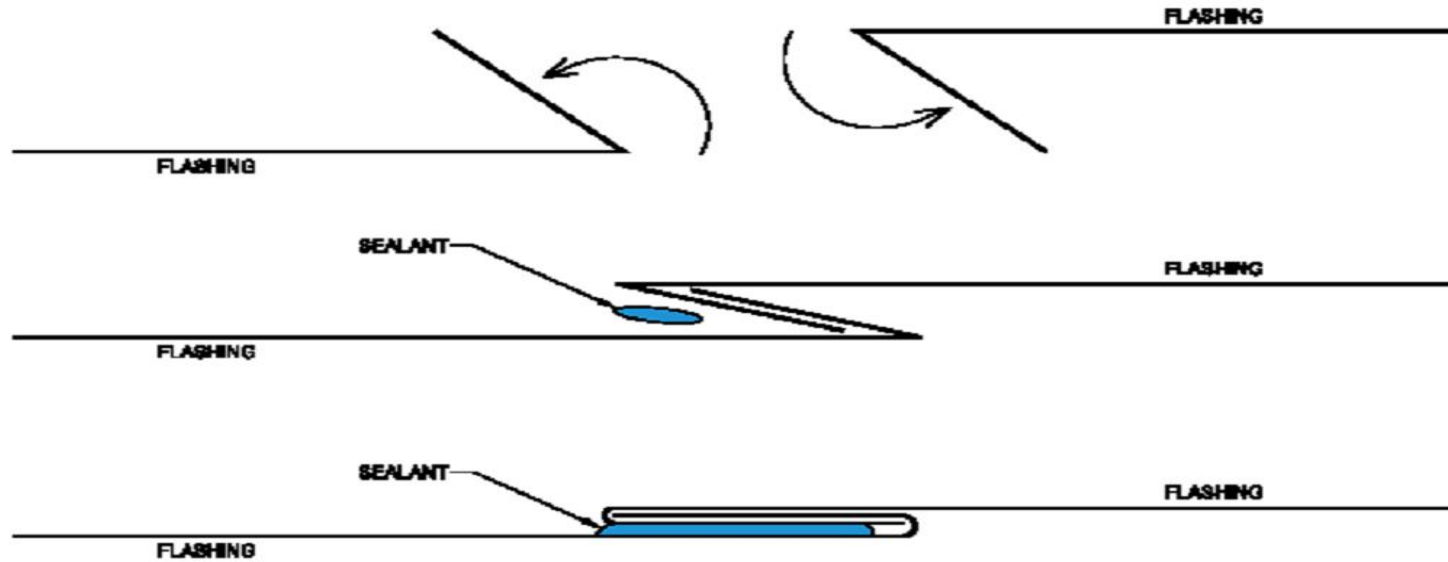
- » No contact with PVC, Vinyl, XEPS, or EPS foam

- Water based latex sealant should not be used

# *Lap Joints*

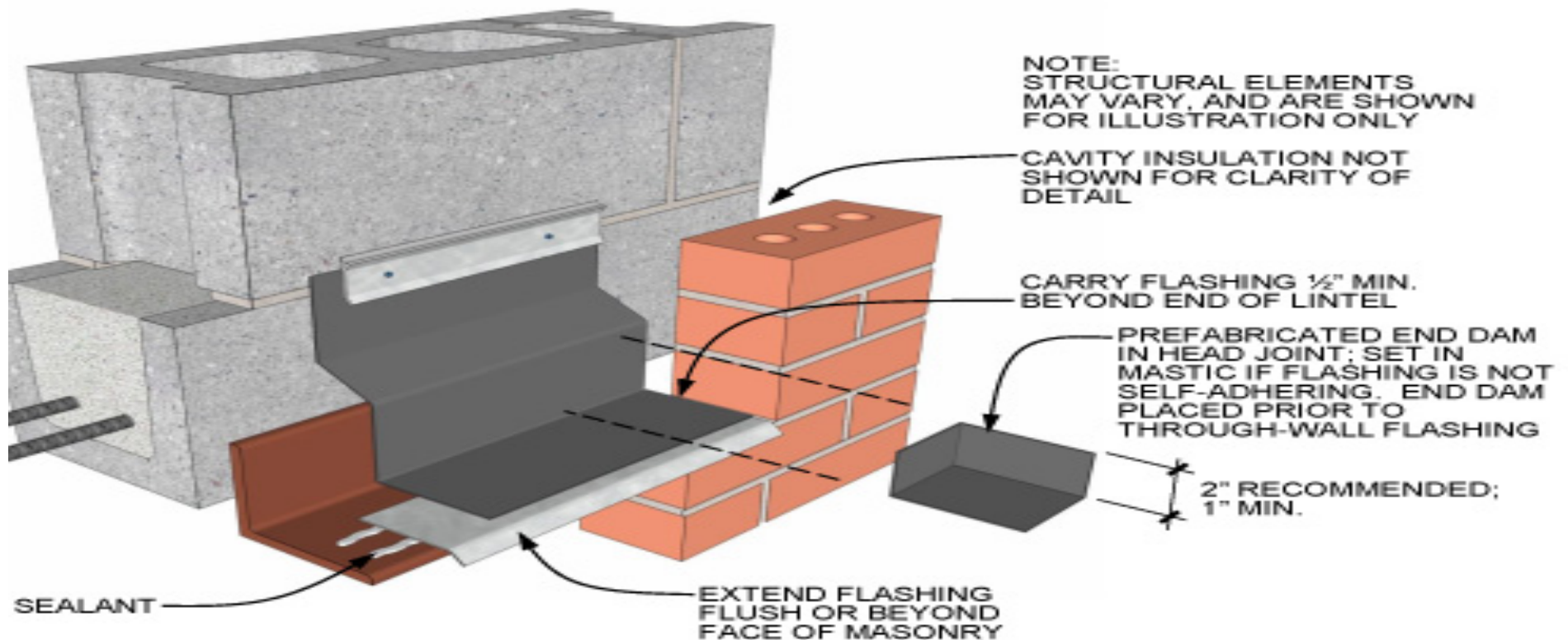
- **Overlap 3" - 6"**
- **Seal with a compatible sealant**
- **Typical number of laps in 100' section:**
  - **Copper Fabric Non-Asphalt: 1**
  - **Drainage Plane Copper: 2**
  - **Copper Fabric Asphalt: 4**
  - **Peel & Stick: 17**
  - **EPDM self adhered: 17**
  - **PVC KEE self adhered: 17**

# Lap Joints



# *End Dams & Corners*

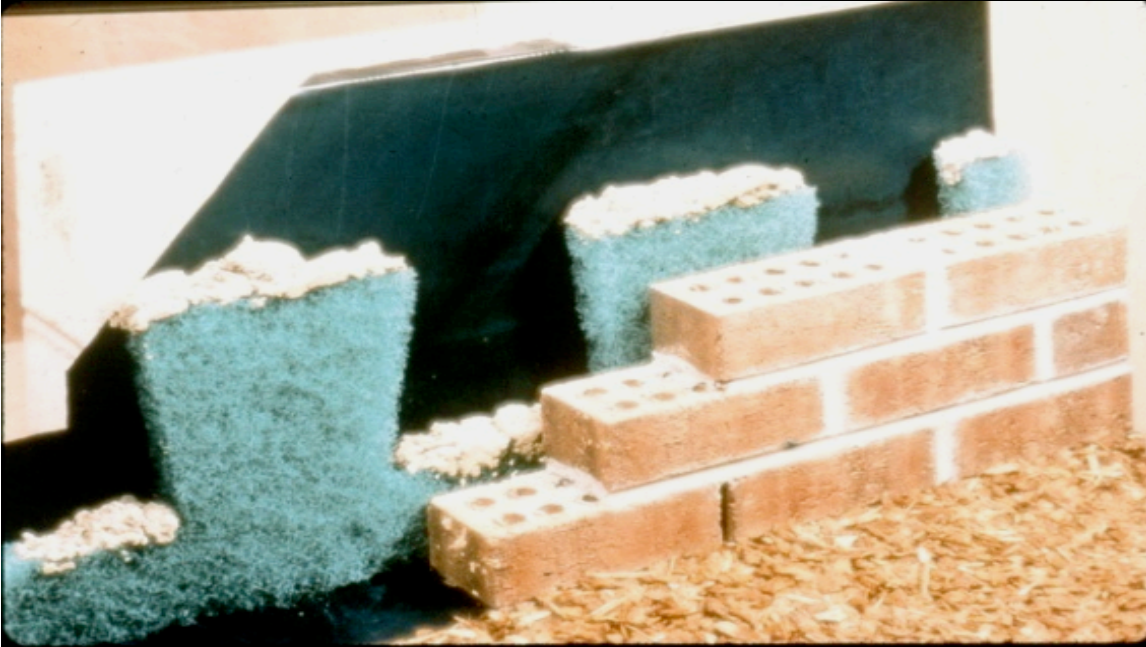
- Prefabricated vs. making them on site
- Material choices



# *Weep Vent Protection Devices*

## – Netting devices

- Keeps mortar droppings from blocking the flow of water to the weep devices
- Flashing must be 6" higher than netting
- 0% to 50% recycled content
- **Does size matter?**





# ***Weep Vent Protection Devices***

- Drainage fabrics
  - Keeps mortar droppings from blocking the flow of water to the weeps
  - Prevents debris & dirt from clogging weeps
  - Reduces efflorescence
  - Insect barrier
  - 90%+ recycled content
  - **One size fits all**



# *Flashing Sealant*

- Don't lay your flashings and/or drip edges down dry....Place them in a bed of compatible sealant



# ***Conclusion/Questions***

- Puncture resistance and tensile strength are “Critical to Quality” properties of through-wall flashings that are measurable and comparable.
- Add longevity, compatibility and ease of installation to selection criteria and increase each of these values as the life expectancy and complexity of the project increases.

\*This concludes the AIA/CES Systems Program

The logo for GBCI CMP, featuring the text "GBCI" in green and "CMP" in grey, both in a bold, sans-serif font, set against a white background with a grey border.

## Through-Wall Flashing Decision Points

What should you expect?

- Strong enough to survive installation without punctures or tears
- Chemically compatible with adjoining materials
- Sustainability, recycled content and end of life recyclability
- Documented Longevity and Lifecycle Costs
- Verified Field Performance
- Long Term Warranty

PROPERTY	Peel & Stick Rubberized	Asphaltic Copper	Multi-Flash Copper	Multi-Flash Stainless
Tensile	1,200 psi	32,000	32,000psi	100,000psi
Puncture Resistance	80 psi	390 psi	780 psi	2,500 psi
<b>Lap Joints per 100'</b>	<b>17</b>	<b>3</b>	<b>1</b>	<b>1</b>
Longevity	Low	High	High	High
Max Warranty Years	5	None	Lifetime	Lifetime

### Compatibility with Air Barriers and Insulations



	Spray Polyurethane Foam	Liquid Applied Asphaltic Air Barrier	Liquid Applied Acrylic Air Barrier	Membrane Applied Asphaltic Air Barrier	Polystyrene Foam Insulation
F					
L	Asphaltic copper fabric				
A	Multi-Flash copper fabric				
S	Multi-Flash Stainless Steel				
H	Flash-Vent Drainage				
I	EPDM				
N	PVC				
G	PVC KEE Self Adhered				
S	Peel & Stick				

NOT COMPATIBLE
CAUTION
COMPATIBLE



All information was obtained from manufacturer's literature and all information is accurate to the best of our knowledge. Please contact York for your CD that has letters of compatibility written from the air barrier and insulation manufacturers for their materials with York's Flash-Vent and Multi-Flash products. Elvaloy® is a registered trademark of the DuPont Company. March 2012.

**What is wrong with  
this picture?**



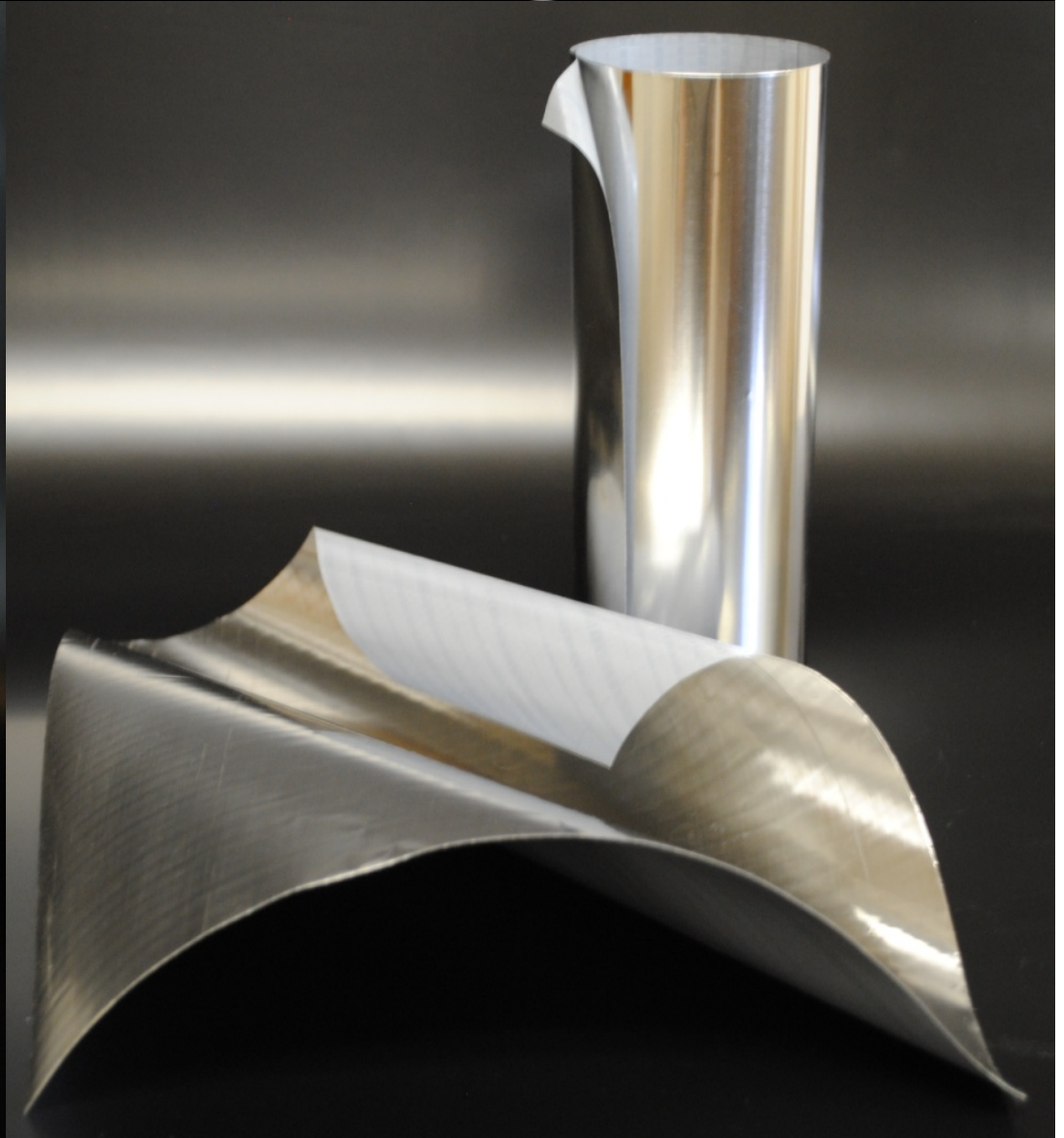
# ***York's Commitment to Producing Green Products***

- **Copper used is 90% recycled**
- **Copper is recyclable**
- **Zero life cycle cost (life of the wall warranty)**
- **Zero waste stream**
- **Renewable adhesive**



# MULTI-FLASH

## Non-Asphaltic Fabric Flashings



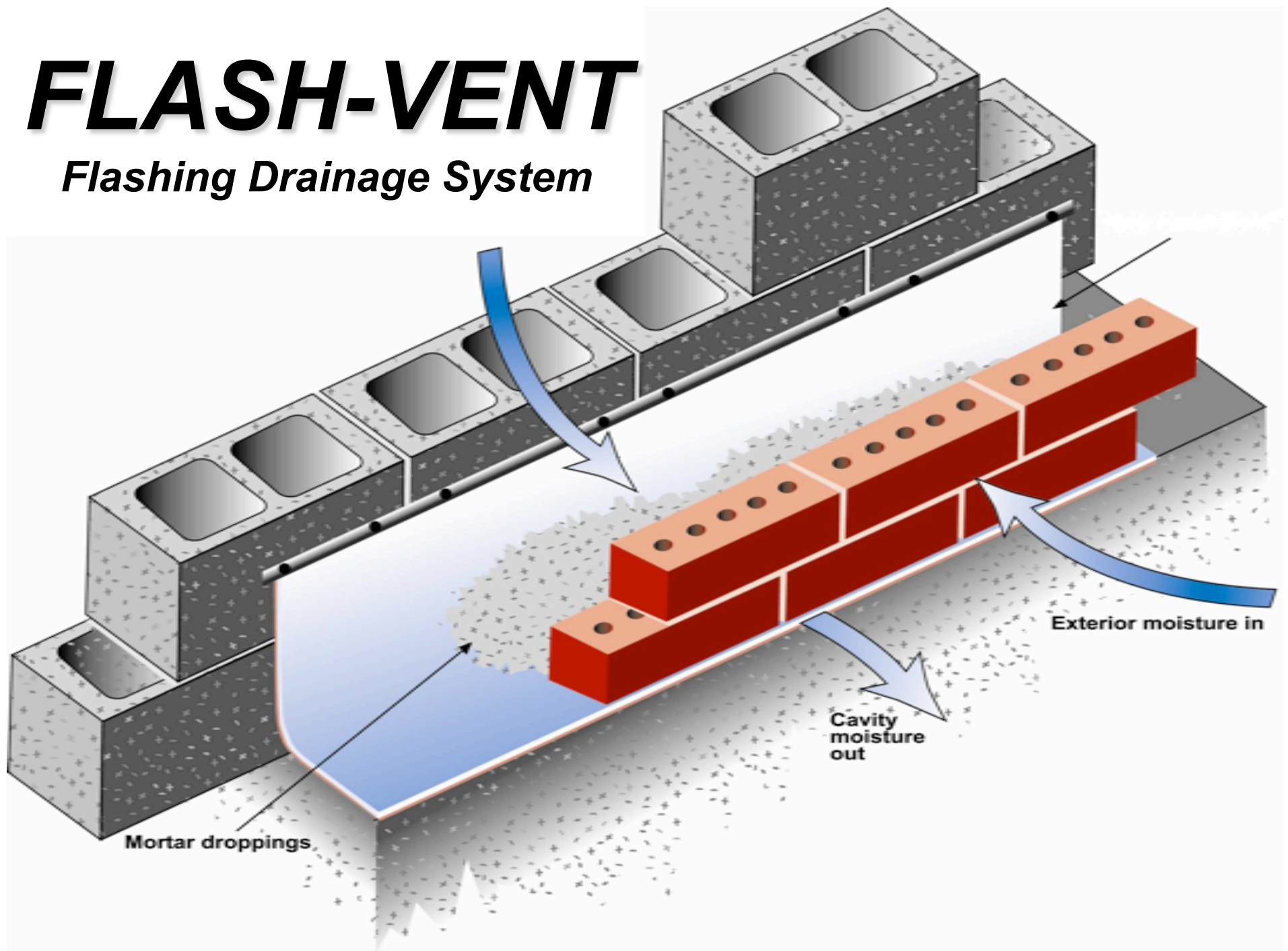
# Performance Characteristics

	Rubberized Asphalt	Asphaltic Copper Fabric 5 oz	Multi-Flash 500 5oz Copper	Stainless Steel Fabric Flashing
Puncture (PSI) (ASTM E154)	80	390	784	2,500+
Tensile (ASTM D412)	1,200	32,000	32,000	100,000+
UV exposure (days)	30	30	60	180
Fire Resistant (ASTM E84)	Not Tested	Not Tested	Pass	Pass
Mold Resistant (ASTM D3273)	Not Tested	Not Tested	Pass	Pass
Recycled Content	1%	90%	90%	60%
Recyclable Material	No	Yes	Yes	Yes
Warranty (average)	5 year	none	Lifetime	Lifetime



# ***FLASH-VENT***

## ***Flashing Drainage System***



# ***2004 FLASH-VENT DEMO***



## ***Cost Comparison: 8/22/2012***

## ***Cost Comparison: Labor***

Installation based on mason hourly rate of \$32.10 per hour (2012 national average) for an eight foot section.

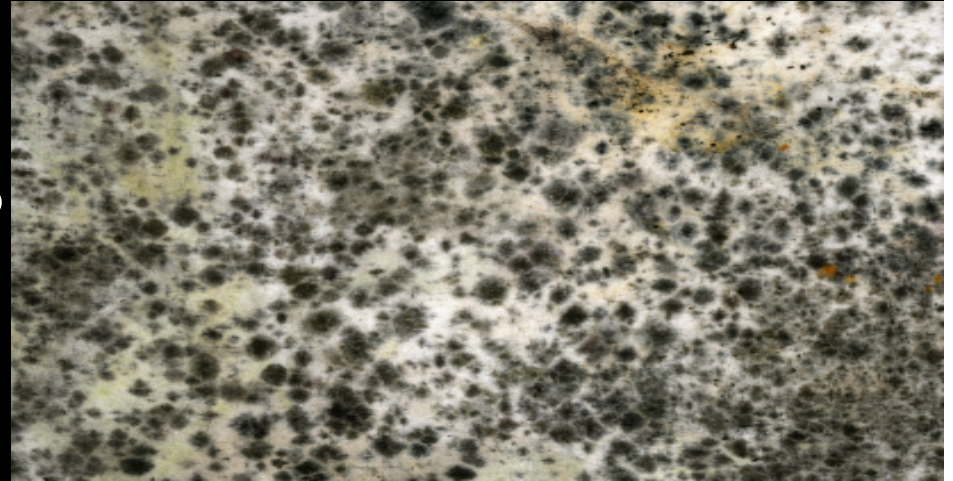
- **Peel and Stick - 32 minutes @ \$0.535/min = \$17.12 or \$2.14 PLF**
- ***Flash-Vent* system -17 minutes @ \$0.535/min = \$9.10 or \$1.14 PLF**

## ***Cost Comparison: Total***

- **TOTAL INSTALLED COST    PLF**
  - Peel-and-Stick -        \$7.99 PLF**
  - Flash-Vent system - \$5.35 PLF**
  - Cost Savings -        \$2.64 PLF**
  
- **Warranty**
  - Peel & Stick –                    5 years**
  - Flash-Vent –                    Life of the wall**

# *Flash-Vent*

- **Mold:**
  - Passes ASTM D3273
  - Passes ASTM G21
- **Flame spread and smoke generation:**
  - Passes ASTM E84
    - Class A material



# Metal splice tape

- Copper or Stainless Steel
- Butyl Adhesive
  - Fire Retardant
  - Incredible bond
- Sent with:
  - Flash-Vent
  - Multi-Flash SS





## *Flash-Vent*

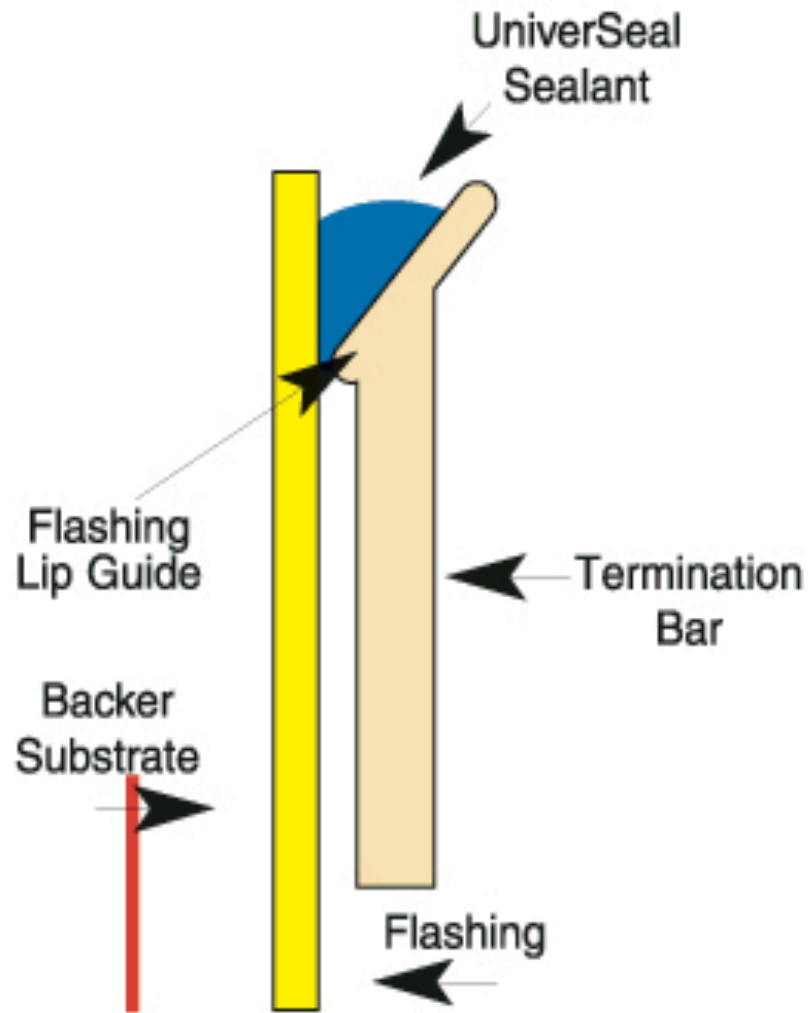
- Stucco, manufactured stone & thin brick
  - Complete wall active drainage system
  - Presentation available Q1 2013



# Weep-Armor



	Mortar Netting	Weep-Armor
1,000 lineal feet	\$3,000 (1" material)	\$714
More than the 8" up the backer wall with flashing	\$300 (Flashing must be above the netting)	Not needed
Shipping	\$188 (2 pallets at \$94 each)	\$30 (2 boxes at \$15 each)
<b>Total</b>	<b><u>\$3,488</u></b>	<b><u>\$744</u></b>
Cardboard	320 sq ft	26 sq ft
Shrink wrap	257 sq ft	0 sq ft
Pallets	2	0
Recycled content	50%	93%



## ***T96 Termination Bar***

# ***UniverSeal US-100***

## **Roofing Contractor Magazine**

**“As contractors and specifiers become familiar with the attributes of polyether MS type sealants, they will rapidly displace the older, more familiar, technologies that now dominate the sealant market.”**

## **Polyether Sealants**

- Meets all VOC requirements
- No solvents
- 100% Solids
- Compatible with almost all building components
- Approved for use with polystyrene by
  - Owens Corning
  - Pactiv
  - Dow

# Spec Check-Up

- Free service offered by York
- Send York your specifications for
  - Masonry flashings
  - Air Barriers
  - Wall insulations



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