






Understanding Tapes and Sealants



www.phrc.psu.edu

1

Description



The building enclosure must address a variety of functions throughout the design and installation process. With modern airtightness goals requiring a more robust system, builders and design professionals must utilize a variety of material options for addressing joints between dissimilar materials. This session will dive into the world of modern enclosure tapes and sealants, including providing an overview of the general types of materials currently on the market. This overview will guide building professionals when considering alternative materials to meet performance expectations.

9

Learning Objectives


1. Discuss the need for modern and robust building materials that directly address airtightness and moisture control.
2. Understand the overall types of tapes available to the residential industry with a focus on material compatibility, installation procedures, and general cost implications.
3. Examine the common types of sealants typically deployed in residential construction including considerations related to long-term exposure, lifespan, and installation needs.
4. Identify strategies for building professionals to weigh building material options with a goal to improve the resiliency and durability of the structure.

10

Disclaimer & Thanks!


- Where trade names appear, no discrimination is intended, and no endorsement by Penn State is implied.
- Thank you!
 - Bryan Kehm (Kehm Design & Consulting LLC)
 - Chad Owens (Envinity)

11 

11

General Notes


- Text quoted from manufacturers will be *italicized*
- Quotes from articles or individuals will be highlighted in **green text**

12 

12

What is Building Science?


- Building science is the cross-disciplinary collection of knowledge and experience required to understand and predict many aspects of the behavior of buildings and their systems, specifically including durability, comfort, energy, environmental separation, indoor air quality, acoustics, lighting, economics, and constructability.

13 

13

Building Enclosure Functions

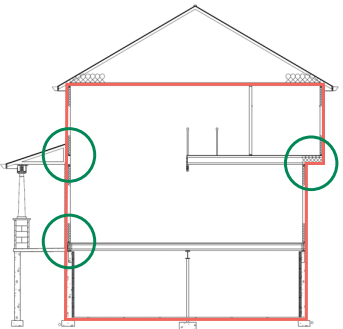
- Support (structural)
- Control (heat, air, moisture, smoke, odor, sound, fire, insects, etc.)
- Aesthetics (exterior and interior finishes)
- Distribution of Services (MEP)



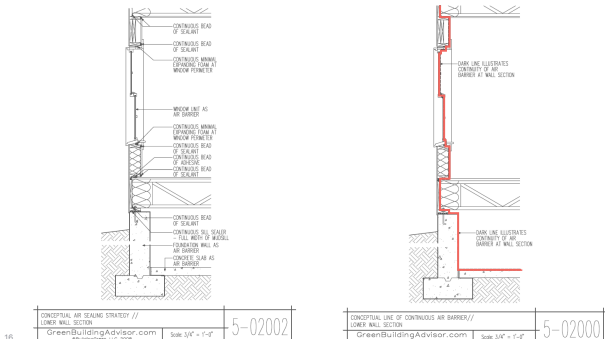
14

Pen Test

- Joints in various materials may require fastening/sealing to adjacent materials for controlling air and/or moisture



15



16



Tapes



17




17

Why Do We Need Tapes?

- Air sealing
- Installing moisture control layers or water-resistive barriers (WRBs)
 - Flashing penetrations

18



18

Common Tape Applications

- Flashing penetrations
- Sealing joints in similar materials
- Sealing joints in dissimilar materials

19



19

Key Considerations


- **Cost**
- **Availability**
- **Compatibility**
- **Installation**
 - Temperature
 - Substrate

20 

20

Types of Tapes

- **Rubberized asphalt**
- **Butyl**
- **Acrylic**

21 

21


Rubberized Asphalt Tapes



22 

22

Rubberized Asphalt Tapes

- These are typically the cheapest of the three types of tape
- Installation notes:
 - Not as effective in cold temperatures (narrow temperature range)
 - Can become brittle over time
 - Compatibility concerns with window installation


23



23


Grace Vycor Plus

- Apply VYCOR® Plus flashing in fair weather when the air, surface and membrane are at temperatures of 25°F (-4°C) or higher. After precipitation, allow a minimum of 24 hours for drying before installing the flashing.



24

www.phrc.com/en/usa/direct/products/vycor-weather-barrier/flashings/vycor-plus



24

Butyl Tapes

25




25

Butyl Tapes

- They are usually less expensive than the acrylics
- Installation notes:
 - Butyl tapes work better at warmer temperatures
 - Typically have strong initial tack
 - Not as forgiving after initial placement


26



26


DuPont Flashing Tape

- DuPont™ Flashing Tape can be installed at external temperatures as low as 25 °F (-4 °C)



27

http://www.dupont.com/products/chemical/flashing_tape.html



27



Acrylic Tapes

28



28

Acrylic Tapes

- Acrylics are usually the most expensive option.
- Installation notes:
 - Most acrylic tapes can be applied in cold temperatures
 - Acrylic tapes are repositionable as the bond strengthens over time
 - Some can adhere to a variety of substrates without priming
 - Broader range of vapor permeability



29

ZIP Tape



- Cold Temperature Application
 - Can be applied in temperature applications as low as 0°F.




30

3M 8067 Flashing Tape - Installation


- Installation Temperature Range: To obtain the best adhesion, 3M™ All Weather Flashing Tape 8067 should be installed when outdoor temperatures range from 0°F (-18°C) up to 120°F (49°C) over clean surfaces that are free from dirt and debris and have not absorbed water.





31

Benjamin Obdyke Hydroflash GP

- *Intended for use on these surfaces: housewrap, felt/building paper, plywood, OSB, Rigid Foam panel, vinyl, fiberglass, wood, windows, and unprimed concrete.*



32 <https://benjaminobdyke.com/product/hydroflash-gp/> 

32

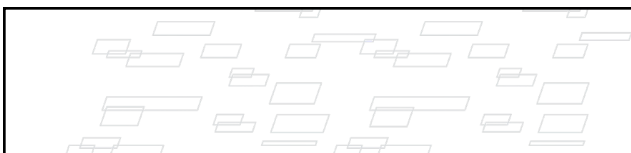


What About Liquid Flashing?





34 

34



General Tape Considerations



36 

36

General Recommendations


- **Follow the manufacturer's installation instructions!**
- **Other considerations**
 - Rollers
 - Primers
 - Compatibility

37 

37


Do I Need a Roller?

- **Most tapes require the tape to be rolled or applied with even pressure**
 - *"This is called "wetting" the tape; the pressure helps the adhesive come in contact with the entire surface under the tape, not just the high points."*
 - <https://www.greenbuildingadvisor.com/article/testing-construction-tapes-part-1>


38 

38

Rollers




<https://www.huberspoof.com/direct-tools/roller-roller-roller-1> <https://www.huberspoof.com/en/system/roller-roller-roller-1>

39 

39

Do I Need a Primer?


- The need for a primer depends on a multitude of factors, including manufacturer guidelines, site conditions, substrate, and experience.
- Is the need for a primer a substantial barrier to constructability?

40 

40

Asphalt: Grace Vycor Plus


- *Priming is generally not required for most substrates provided they are clean and dry. However, on concrete, masonry and DensGlass Gold®, apply PERM-A-BARRIER® WB Primer.*

41 <https://ccost.com/en/solutions/products/vycor-wastite-barrier-deshing-chips/vycor-plus> 

41

Butyl: DuPont Flashing Tape

- *Adverse weather conditions or cold temperatures may require use of a primer to promote adhesion of DuPont Self-Adhered Flashing Products to common building materials. Concrete, masonry, and fiber-faced exterior gypsum board require the use of DuPont Adhesive/Primer.*

42 <https://www.dupont.com/products/dupont-flashing-tape.html> 

42

Acrylic: 3M 8067 Flashing Tape


- Adheres to most common building materials. For difficult to stick to surfaces, test flashing tape adhesion before application.
- Use 3M™ Hi-Strength 90 Spray Adhesive to prime the substrate as needed prior to applying the flashing tape.

43 https://www.3m.com/3M/en_US/en/4940068318/ 

43

Know Your Products

- You should have some assurance that the product you select will adhere to the respective substrates
 - Manufacturer data
 - Experience
 - Testing
- Consider testing your products!

44 

44

Critical Considerations: Compatibility


- When tapes touch proprietary materials, the literature of the manufacturer of those materials should be consulted to ensure compatibility.
 - Example:
 - Taping a window flange to a WRB - which tape is allowable?
 - Review installation guidelines for WRB and for window to determine approved materials.
- Don't forget about product warranties!

45 

45


More on Compatibility

- **If the tape sticks, why does it matter if the manufacturer approves the product?**
 - System warranty and future risk/litigation
- **Manufacturer approval is much more critical for moisture-related installation vs. air sealing**

46 

46


Example 1: Window Flashing

47 

47

Key Considerations

- **Cost:**
 - Frequent detail – cost per LF of product adds up
- **Availability**
 - Window flashing products are more common and more likely to be in-stock or on-hand
- **Compatibility**
 - Window flashing is often part of the overall WRB system
- **Installation**
 - Temperature – less scheduling flexibility
 - Substrate – window flange and WRB surface

48 

48



49




50

ZIP Installation Instructions

- FLASHINGS – TAPES**

- ZIP System flashing tape must be used where two ZIP System panels come together to create a panel joint at inside corners, outside corners and in the same plane; however, other code approved flashing tapes that satisfy AAMA-711 or AC-148 can be used to flash rough openings, penetrations, and fenestrations.

<https://www.hubstremood.com/zip-system/flashings-tape>



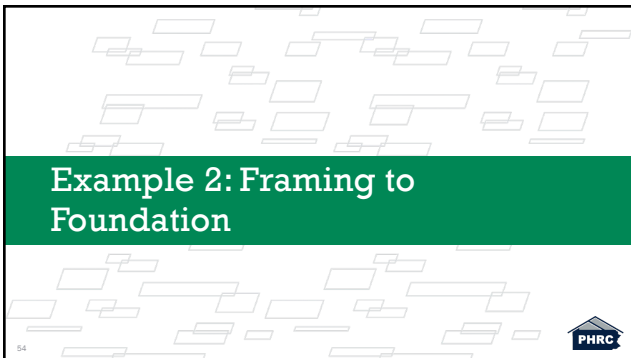
51



52




53




54

Exterior Joint Sealing Options



- **Common materials include tapes and liquid flashing**
 - Note: some tapes may require a primer

58



58



59




59

Practical Recommendations

from Bryan Kehm

- Differentiate when to use a tape, sealant, gasket, membrane, or spray foam
- Provide a tape and gasket box on the job site
- Provide an air & WRB penetration schedule with materials/methods to use on the plans


60



60

More Recommendations/Questions

- Are you confident that your subs have the right tape to be installed in current conditions?
- Should you consider developing a cold weather design and a warm-weather design and material spec?

61 

61

Questions?

www.phrc.psu.edu

62 

62

Resources

- <https://buildingscience.com/documents/insights/bsi-067-stuck-on-you>
- <https://www.greenbuildingadvisor.com/article/testing-construction-tapes-part-1>
- <https://www.greenbuildingadvisor.com/app/uploads/sites/default/files/Backyard%20Tape%20Test%20-%20final.pdf>
- <https://benjaminobyke.com/insights/understanding-adhesive-technology-acrylic-vs-butyl-vs-asphalt/>

63 

63