

Backyard Tape Test

An unscientific—but telling—trial of air-sealing tapes



BY MARTIN HOLLADAY

Anyone building an energy-efficient house has to pay attention to airtightness. Leaks can occur through cracks between panels of wall sheathing, around windows and doors, at wall and ceiling penetrations, and in a variety of other places. While some of these leaks can be sealed with caulk or spray foam,

others are best sealed with a high-quality construction tape.

Manufacturers offer a variety of flexible flashings and construction tapes, ranging from inexpensive products that look like packing tape to European peel-and-stick tapes costing more than \$100 a roll. Of course, virtually all manufacturers claim their products are sticky and durable. To sort the hype

from the facts, I asked a number of builders about their favorite tapes, then tested 11 recommended products. While I still have questions, I gained a better understanding of how to use different tapes for air-sealing.

Three major types

Three types of adhesive are used to make construction tapes: rubberized asphalt,



butyl, and acrylic. Rubberized-asphalt tapes (also known as modified-bitumen tapes) are made from the same material as peel-and-stick roofing membranes such as Grace Ice & Water Shield. When used to flash window rough openings, these tapes are usually called *flexible flashing*. Although rubberized asphalt tapes are useful for flashing windows, they have a few disadvantages: They aren't very

THE CONTENDERS

Eleven tapes were affixed to appropriate substrates on a wall of my backyard woodshed. After a month, I peeled them back to see which ones stuck and which ones didn't.

Dow Weathermate

1 7/8 in. wide, 7¢ per ft. • weathermate.com

This tape has a polypropylene film and an acrylic adhesive. The manufacturer recommends it for housewrap or XPS sheathing.

It can be installed at temperatures ranging from 15°F to 120°F.



Venture 1520CW foil-faced tape

2 in. wide, 7¢ per ft. • venturertape.com

This aluminum-foil tape has a solvent-acrylic adhesive. The manufacturer recommends it for ducts.

The minimum application temperature is -25°F.



Venture 1585CW-P2 tape

2 in. wide, 7¢ per ft.

This housewrap tape has a polypropylene film and an acrylic adhesive. The manufacturer recommends it for exterior sheathing, XPS, housewrap, and polyethylene film.

It can be installed at temperatures ranging from 10°F to 120°F.



Venture 1585HT/W tape

3 in. wide, 10¢ per ft.

This tape is identical to Venture 1585CW-P2, except that it has a little bit more adhesive.

It can be installed at temperatures ranging from 10°F to 120°F.



Nashua waterproofing repair tape

1 7/8 in. wide, 30¢ per ft. • berryplastics.com

This aluminum-foil tape has a butyl adhesive. The manufacturer recommends it for gutter repair, roof-valley repair, and tears in metal building panels.

It can be installed at temperatures ranging from 40°F to 200°F.



THE CONTENDERS *continued*

Zip System tape

3¾ in. wide, 30¢ per ft.
zipsystem.com

This tape has an acrylic adhesive and is recommended for use with the manufacturer's proprietary OSB sheathing panels.

The minimum application temperature is 20°F.

Siga Sicrall tape

2¾ in. wide, 38¢ per ft.
smallplanetworkshopstore.com

This European product is a paper tape with a solid-acrylic adhesive. The manufacturer recommends it for interior use only, to seal seams in polyethylene, OSB, and plywood.

The minimum application temperature is 14°F.

Pro Clima Tescon No. 1 tape

2¾ in. wide, 43¢ per ft. • foursevenfive.com

This European tape has a solid acrylic adhesive and is fairly stretchy. The manufacturer recommends it for interior or exterior use on OSB, plywood, and smart vapor retarders. According to Ken Levensen, a co-owner of Four Seven Five, a distributor of European tapes, "Tescon No. 1 is an all-around tape. Because it's stretchy, it's good for wire penetrations, for duct sealing, or for construction joints that are prone to movement." At 8 perms, the tape is fairly vapor permeable.

The minimum application temperature is 15°F.

Polyken Shadowlastic 627-20 tape

4 in. wide, 31¢ per ft.
berryplastics.com

This peel-and-stick flashing tape has a polyethylene film and 14 mils of butyl adhesive. The manufacturer recommends it for window flashing as well as for sealing air leaks in plywood, OSB, and housewrap.

It can be installed at temperatures ranging from 30°F to 180°F.

3M All Weather Flashing Tape #8067

4 in. wide, 43¢ per ft.
solutions.3m.com

This tape has a solvent-based acrylic adhesive. The manufacturer, which recommends it around openings in exterior walls and for sealing penetrations in exterior walls and roofs, claims that "it even adheres to damp surfaces."

It can be installed at temperatures ranging from 0°F to 120°F.

Siga Wigluv tape

2¼ in. wide, 47¢ per ft.
smallplanetworkshopstore.com

This European tape has a polyolefin backing and a solid-acrylic adhesive. At 1.7 perms, it is somewhat vapor permeable.

The manufacturer recommends it for interior or exterior use on OSB, plywood, or rigid-foam insulation.

sticky in cold weather, and they don't stick well to any surface that is dirty or wet.

Tapes with a butyl adhesive generally cost more than rubberized-asphalt tapes and are seen as higher in quality. Like rubberized-asphalt tapes, butyl tapes have a black adhesive and a peel-away paper backing. Here's how to tell the difference: Butyl tapes lack the asphalt smell of rubberized-asphalt tapes and feel more rubbery.

Butyl tapes are less likely to ooze at high temperatures than rubberized-asphalt tapes. They also perform better at cold temperatures and are more tenacious (although the butyl bond takes longer to develop than the instant tackiness shown by rubberized-asphalt tapes). Examples of butyl tapes include Nashua's waterproofing repair tape, Polyken Shadowlastic 627-20, and Tyvek FlexWrap. Because of its flexibility, Tyvek FlexWrap is an excellent product for flashing window rough openings. FlexWrap is rarely used to tape flat panel seams, however, so it was not included in this test.

Acrylic adhesive is used to manufacture a wide variety of tapes, including inexpensive housewrap tapes that look like packing tape (for example, Dow Weathermate), Zip System tape, and expensive European construction tapes with peel-away paper backings. European manufacturers such as Pro Clima and Siga claim that their tapes have a "solid acrylic" adhesive that performs better than the acrylic adhesives modified by solvents that are used on less expensive

The economics of sheathing plus tape

OSB is cheaper than plywood but harder to tape. If OSB requires a very expensive tape, does using OSB represent false economy?

The answer depends on the local cost of OSB and plywood. Zip System tape (30¢ per ft.) is a reasonable choice for taping plywood and is 17¢ per ft. cheaper than Siga Wigluv, the only reasonable choice for taping OSB. If you apply an average of 12 ft. of tape per panel, using OSB will increase your tape bill by \$2.04 per panel. My local lumberyard charges \$6.22 more per panel for plywood than OSB, so OSB is a reasonable choice, even considering the cost of expensive tape.



American tapes. Manufacturers of tapes with solid-acrylic adhesives claim that the tapes adhere well even to damp surfaces. One possible downside to these solid-acrylic adhesives is that they can take days to achieve full strength. Also, the performance of tapes with acrylic adhesives varies widely. While inexpensive acrylic tapes aren't very tenacious, the best acrylic tapes outperform all other types of air-sealing tape.

Housewrap tape does not do it all

I started by asking over a dozen builders and building experts which tapes they use on a variety of materials. As most builders know, some materials—including housewrap, plywood, and foil-faced rigid foam—are relatively easy to tape. Others, such as XPS, polyethylene, concrete, and especially OSB, are trickier. Most builders I spoke with were unfamiliar with Pro Clima and Siga tapes from Europe, and even those who knew about them were often scared away by their high price.

Many builders use housewrap tape to seal seams in almost everything. While some manufacturers advertise that their housewrap tapes are suitable for a variety of materials, others are more conservative. For example, DuPont warns against the use of Tyvek tape for sealing seams in plywood, OSB, or XPS foam. "The tape is designed to stick to Tyvek wrap," says Alan Hubbell, a residential marketing manager for Tyvek. "Plywood and foam will expand at different rates from the tape, and over time, it will crinkle and wrinkle and pull off."

Does vapor permeance matter?

At least two of the tapes tested for this article, Pro Clima Tescon No. 1 and Siga Wigluv, are touted as vapor permeable. Most builders, however, don't worry about the perm rating of their tapes; after all, the tapes cover only a small percentage of a wall or ceiling. They conclude that any vapor that needs to escape from the wall will be able to evaporate through the untaped areas.

Marketers of vapor-permeable European tapes, however, tout the advantages of a high perm rating. According

to Floris Keverling Buisman, a co-owner of tape distributor Four Seven Five, "On the outside, if you have two weather-resistant barriers that are overlapping, and if you use a very wide piece of Bituthene to seal the seam, there might be a problem because the Bituthene is vapor-closed."

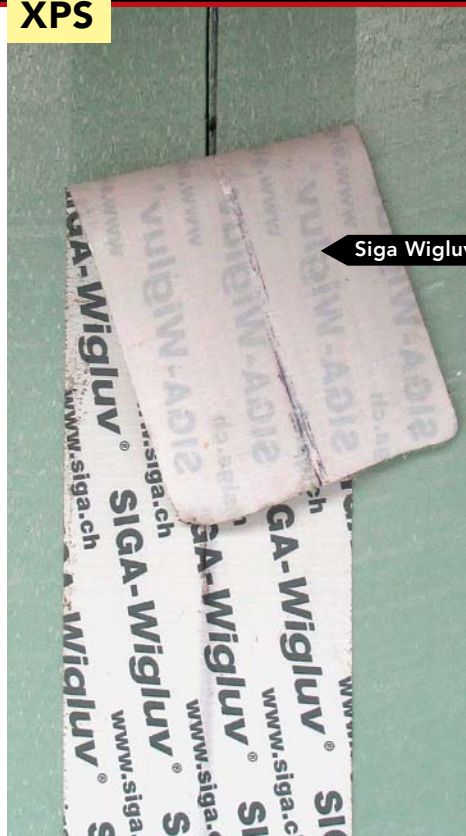
Albert Rooks of Small Planet Workshop also praises high-perm tapes. "If you ever have a wet wall assembly, a vapor-permeable tape on the exterior sheathing allows the assembly to dry

through the joints," he says. "If you tape a wet assembly and it freezes at night, the water turns to ice. In some cases, the ice could pop the tape joint. With a vapor-permeable tape, there should be less water buildup at the sheathing joint."

At this point, building scientists don't have enough data to determine the likelihood of the scenarios described by Buisman and Rooks. When it comes to determining the importance of tape permeance, the jury is still out.

THERE'S NO SUCH THING

XPS



Siga Wigluv

The XPS test was conducted on blue Dow Styrofoam. In general, XPS is trickier to tape than plywood or foil-faced polyisocyanurate. Two tapes tied for first place: **Siga Wigluv** and **Siga Sicrall** both had excellent performance. The next-best tape, 3M All Weather Flashing Tape, performed well. The other four tested tapes were noticeably less sticky than the winning tapes. Pro Clima Tescon No. 1 and Zip System tape were disappointing, while Polyken Shadowlastic and Dow Weathermate were the worst-performing tapes tested.

Foil-faced polyiso



Venture 1585CW-P2

Foil-faced polyisocyanurate is a pleasure to tape. The four tapes that tied for first place ranged widely in price: **Venture 1585CW-P2 housewrap tape**, **Nashua waterproofing repair tape**, **Polyken Shadowlastic**, and **Siga Wigluv**. Because the Venture housewrap tape is so affordable, it's clearly the tape to choose for this material.

The runner-up, Siga Sicrall, performed almost as well as the winners. In descending order, the losers were Dow Weathermate and Venture 1520CW. Although many builders assume that foil-faced tapes work best for this application, my testing did not bear this out. Venture 1520CW is a foil-faced tape, while three of the best-performing tapes do not have foil facing.

Plywood



3M All Weather Flashing Tape

Plywood is always easier to tape than OSB; I used CDX plywood for the test. Three tapes tied for first place: **3M All Weather Flashing Tape**, **Siga Wigluv**, and **Siga Sicrall**. Pro Clima Tescon No. 1 adhered well, but the tape itself is weak and ripped when it was removed. Zip System tape adhered well and was a credible runner-up. In descending order, the losers were Polyken Shadowlastic, Venture 1585CW-P2, and Dow Weathermate.

Builders who aren't satisfied with the performance of housewrap tape on XPS or plywood often choose a more expensive (and better performing) tape—either 3M All Weather Flashing Tape or Zip System tape. Another approach is to use a rubberized-asphalt peel-and-stick tape like Grace Vycor for plywood and OSB seams. Because rubberized-asphalt tapes don't work well in cold weather, I didn't include them in this test. Warm-climate builders should still consider using a rubberized-asphalt tape to seal plywood and OSB seams.

Backyard testing reveals the most tenacious tapes

To see how different tapes perform, I fastened a series of 8-ft. vertical strips of different materials to the west wall of my woodshed in

northern Vermont: XPS, foil-faced polyisocyanurate, plywood, OSB, housewrap, and polyethylene. I sealed seams in each material with four to eight tape samples. Each piece of tape was at least 2 ft. long, allowing me to test up to four types of tape at each vertical 8-ft. seam.

Although protected by a roof overhang, the wall is still exposed to wind-driven rain. Despite that, Siga Sicrall, which is intended for interior use, fared well in the testing. When the tapes were applied, the materials were dry and job-site clean.

The tapes were installed on October 9. On November 12, I peeled back about 3 in. of each tape to judge its tenacity. Some samples were so tightly attached that it was impossible to pull them back that far. The ratings given in my test report are based on my own judgment of

AS ALL-PURPOSE TAPE

OSB



Siga Wigluv

OSB, the hardest substrate to tape, has a smooth side and a rough side. The smooth side is easier to tape, but building inspectors often insist that builders install OSB with the smooth side in so that the manufacturer's grade stamps can be read. Because of this, OSB tape has to be able to perform well on the rough side of the OSB, so that's the side I tested.

Small Planet Workshop, a distributor of European tapes, has this statement on its website: "In our experience, no tape will stick to the rough side of OSB without the use of a primer like Siga Dockskin." At least with the OSB I used, however, one tape (Siga Wigluv) performed well on unprimed OSB. I tested four tapes on both unprimed OSB and primed OSB. For the test on primed OSB, I used a high-quality European primer (Tescon Primer RP).

Siga Wigluv was the clear winner in this category. The tape adhered very well to the OSB, with or without a primer. Pro Clima Tescon No. 1 was the runner-up tape, but only when used with a primer. Without a primer, Tescon No. 1 was the worst-performing of the four tapes. Zip System tape and 3M All Weather Flashing Tape did not perform well on OSB.

Housewrap



Zip System tape

Most brands of housewrap are easy to tape; I used Typar for my test. Three tapes tied for first place: **3M All Weather Flashing Tape, Zip System tape, and Siga Sicrall**. The next-best tapes were the two housewrap tapes from Venture (Venture 1585CW-P2 and Venture 1585HT/W), which performed about the same. These two tapes cost so much less than the best-performing tapes that they are probably the tapes to choose. The worst-performing tape was Dow Weathermate.

Polyethylene



Polyken Shadowlastic

Polyethylene sheeting has a reputation of being difficult to tape, so I was delighted to discover that three tapes performed very well on polyethylene: **Siga Wigluv, Siga Sicrall, and Polyken Shadowlastic**. The four other tested tapes—Dow Weathermate, Venture 1585CW-P2, Venture 1585HT/W, and Pro Clima Tescon No. 1—all performed so poorly on polyethylene that they are not recommended for this purpose.

tenacity. I made no attempt to gauge whether any of the tapes created an airtight seal. I didn't use any tools other than my eyes and my bare hands, so this backyard test makes no claims to scientific validity. I rated a tape highly if it was difficult to peel back after it had remained in place for one month. While it seems logical to me to favor tenacious tapes over tapes that don't hold very well, I'll leave it to readers to judge whether my criterion was valid.

Because I couldn't test all tapes on all materials, I focused on tapes that builders or manufacturers recommended for specific materials. I tested seven tapes on XPS, eight tapes on foil-faced polyiso, eight tapes on plywood, four tapes on OSB (with and without a primer), six tapes on Typar housewrap, and six tapes on polyethylene.

Although I tested only three housewrap tapes—one from Dow and two from Venture—many other manufacturers produce similar tapes, including 3M, Berry Plastics, DuPont, Johns Manville, and Typar. All of these housewrap tapes have a thin polypropylene film coated with a solvent-based acrylic adhesive.

No single tape emerged the winner. While at least one inexpensive tape performed very well on foil-faced polyiso, the only tapes that work on OSB are fairly expensive. My conclusion: It makes sense to use different tapes for different materials. □

Martin Holladay is a senior editor. Photos by the author, except where noted.