

DuPont™ Tyvek® Water-Resistive Barriers vs. ZIP System® Wall Sheathing

TECH TALK

DuPont™ Tyvek® Water-Resistive Barriers (WRBs) offer superior performance, ease of use, and compatibility with a broad range of cladding materials.



DuPont™ Tyvek® WRBs stand up to the rigors of a construction job site, provide homes with superior water resistance and wall system drying capability for years to come.

DuPont™ Tyvek® WRBs give you the durability, performance and ease of use needed to build more comfortable and energy-efficient homes. Trusted by quality building professionals everywhere, DuPont™ Tyvek® Water-Resistive Barriers, part of the complete DuPont™ Weatherization Systems offering, provide superior performance compared to ZIP System® wall sheathing (water-resistive membranes bonded to wood-based sheathing) as further described below.

The primary purpose of house wrap is to help prevent water damage to the homes you build. In order to accomplish this, products need to survive the rigors of the construction process and perform to specification after installation. WRBs should:

- be *durable* enough to withstand job-site challenges during installation;
- provide *water resistance* to ensure the home is protected from moisture intrusion;
- allow *wall system drying*;
- be *compatible* with a broad range of cladding materials; and
- offer *ease of use* for installation and on-site repairs.



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Durability

DuPont™ Tyvek® WRBs are engineered to withstand the rugged conditions encountered on construction job sites.

Tear resistance

DuPont™ Tyvek® WRBs are strong nonwoven structures resistant to tearing and punctures, providing you with forgiving products on the job site. If, however, DuPont™ Tyvek® WRBs should become torn or punctured, for example when wall panels are lifted with a fork lift, they can be easily repaired with DuPont™ Tyvek® Tape.

Similar damage to ZIP System® wall sheathing is much more difficult to repair. As shown in this job site photo, not only is the laminated WRB of the ZIP System® damaged, the underlying sheathing material is also damaged. These damaged areas must be carefully repaired and precisely taped to ensure the integrity of the wall system. Because this is so difficult, if not impossible to do on the job site, damaged ZIP System® wall sheathing is more likely to be discarded than to be repaired in the field, adding to project cost and waste.



Rugged conditions on the job site often cause damage not only to the laminated WRB of the ZIP System®, but to the underlying sheathing material as well.

UV resistance

Protection from UV damage is critical because cladding is frequently installed several days, or even weeks, after installation of the WRB. DuPont™ Tyvek® HomeWrap®, DuPont™ Tyvek® DrainWrap™ and DuPont™ Tyvek® StuccoWrap® provide a minimum of 120 days UV resistance. DuPont™ Tyvek® CommercialWrap®, specially engineered for buildings of five or more stories, provides 270 days of UV resistance. On the other hand, ZIP System® wall sheathing must be covered in less than 90 days.

Water resistance

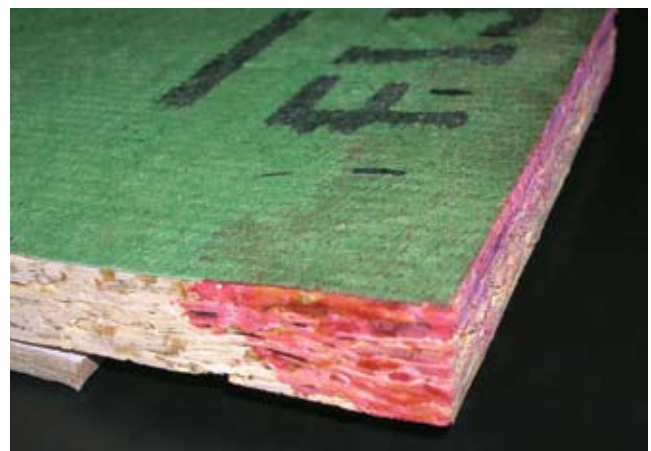
The 2006 International Residential Code (IRC) defines a WRB as “a material behind an exterior wall covering that is intended to resist liquid water that has penetrated behind the exterior covering from further intruding into the exterior wall assembly.”

DuPont™ Tyvek® WRBs are comprised of a continuous filament barrier, precisely bonded, to provide bulk water hold-out and high breathability. When installed and integrated into a properly flashed wall system, DuPont™ Tyvek® WRBs help to guide water out of the wall and promote rapid drying.

The bulk water hold-out capability of ZIP System® wall sheathing is highly dependent on the precise taping of all joints because the edges of OSB sheathing will readily absorb water and distribute it by capillary action. This results in permanent edge swell and delamination of the WRB, which severely compromises performance.

Furthermore, if there is a tape failure, ZIP System® wall sheathing is more vulnerable to water intrusion because the seams of the WRB and the OSB sheathing are completely aligned.

In contrast, when DuPont™ Tyvek® WRBs are used, there is no direct pathway to the seams and edges of the OSB sheathing because the seams of the WRB and sheathing are staggered.



When a thin profile ZIP System® wall sheathing was tested per ASTM D2065, it exhibited partial delamination and a permanent edge swell of 16%.

Wall system drying

To meet minimum vapor permeable WRB requirements, the WRB must have a vapor permeance of at least 5 perms, as tested per ASTM E96 B (desiccant method).

Third-party laboratory testing of the vapor permeability of ZIP System® wall sheathing shows that it has vapor permeability less than 1 perm, under both wet and dry cup measurement conditions. Because ZIP System® wall sheathing requires all seams to be sealed with tape, installed ZIP System® wall sheathing constitutes an exterior, non-insulated vapor barrier. As such, it can be subject to condensation during cold weather. An exterior vapor barrier significantly reduces drying capability of the wall system if moisture enters through any mechanism.

In contrast, current DuPont™ Tyvek® WRBs have permeability ratings ranging from 20 to 60 perms. This high permeability allows the wall system to maintain a higher drying capability than wall systems utilizing ZIP System® wall sheathing.

Compatibility

DuPont™ Tyvek® WRBs are compatible with a broad range of cladding materials, making them ideal for today's home designs that often incorporate several different facade materials, such as stone and stucco, or brick and vinyl siding. Specially engineered styles, such as DuPont™ Tyvek® StuccoWrap® and DuPont™ Tyvek® DrainWrap™ provide optimum performance for specific applications, i.e., EIFS.

On the other hand, ZIP System® wall sheathing has several limitations due to compatibility issues. ZIP System® wall sheathing is not suitable for combination cladding walls, such as brick and EIFS, because it would be difficult to maintain water-resistive barrier continuity.

In addition, ZIP System® seam tape cannot be used on other sheathing products, making ZIP System® wall sheathing unsuitable for use in situations where a mix of sheathing is desired. DuPont™ Tyvek® WRBs effectively cover different sheathings and the junctions between them.

Reverse shingling, required in many ZIP System® wall sheathing installation details, presents another challenge. These details will be entirely dependent on the quality of the adhesion of the tape or self-adhered flashing to the surface of the panel material. The self-adhered flashing product is not part of the total system, nor is it specified in the installation guidelines, except to say that it must meet AC148. Therefore, there is no assurance that the flashing product selected will be compatible with the ZIP System® wall sheathing.

Ease of use

Proper installation is important for all products, but for some, it is more difficult to achieve. DuPont™ Tyvek® WRBs are easy to install and simple to repair if damaged on the job site.

The performance of ZIP System® wall sheathing is entirely dependent on the performance of the taped seams. The tape installation is crucial, but it is also complicated, with tight tolerances: the ZIP System® seam tape edges must be sealed and the tape centered within +/- ½ inch of all panel edge seam centers — with no wrinkles in the applied tape. Joints which occur at corners are difficult to tape and often are “overlooked” in the field, adversely affecting performance.

Energy efficiency

DuPont™ Tyvek® WRBs can be installed as air barriers per ASTM E1677-95, thereby reducing energy consumption and helping to contribute to sustainable building designs. DuPont™ Tyvek® WRBs can contribute to LEED® credits in several categories including improved energy efficiency and indoor air quality. They meet new ENERGY STAR® Thermal Bypass Checklist requirements as an exterior air barrier and also qualify as an “air-retarding wrap” for the California Energy Commission (CEC) Title 24 Housewrap Credit.

Summary

Use of DuPont™ Tyvek® WRBs provides you with a highly tear- and UV-resistant product, allowing for ease of installation and flexible trade scheduling. It provides homeowners with a highly bulk-water-resistant barrier while at the same time allowing for excellent wall system drying when required. Fundamentally, the use of DuPont™ Tyvek® WRBs results in a more durable, more forgiving wall system when contrasted to current products laminated to wood sheathing.

Superior products, unparalleled support

DuPont™ Tyvek® Specialist Network

DuPont™ Tyvek® WRBs are backed by over 25 years of innovative building science and a national group of over 190 highly-trained field representatives who are available to assist you with your installations. From the latest updates on building codes, to keeping up with current trends and challenges, your local DuPont™ Tyvek® Specialist can provide on-site consulting and training to help make sure the job gets done right.

DuPont™ Tyvek® Certified Installers

The DuPont™ Tyvek® Certified Installer Program is one more way to put the building science expertise of DuPont right at your fingertips. Your Certified Installer provides trained installation services to help seal the building envelope.

10-Year Limited Warranty

The complete line of DuPont™ Tyvek® WRBs, tapes, flashings and sealants integrate seamlessly to help you seal the building envelope so you can rest assured that the homes you build are more energy efficient and better protected. To back it up, DuPont™ Tyvek® also offers a 10-Year Limited Warranty on certain products. Please refer to www.Construction.Tyvek.com for warranty details.

Continuing Education Units

To help you stay current on building practices and specifications, your local DuPont™ Tyvek® Specialist offers AIA and CES learning units, as well as Building Science Seminars.



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