DuPont offers six different DuPont™ Tyvek® building wraps intended for use on a wide range of buildings from single family homes to high rise structures. DuPont™ Tyvek® HomeWrap®, Tyvek® DrainWrap™, Tyvek® ThermaWrap™ and Tyvek® StuccoWrap® are primarily used on residential and light commercial structures. DuPont™ Tyvek® CommercialWrap® and Tyvek® CommercialWrap® D were specifically engineered to offer a higher level of durability often required in commercial construction. All DuPont™ Tyvek® building wraps are Type 1 air barriers when tested in accordance with ASTM E1677, and meet the requirements of IECC 2012 Section C402.4.1.2.1. All are suitable for use with a broad range of cladding materials.

It’s virtually impossible, and prohibitively expensive, to build a wall system with no risk of air and water infiltration. So, it is essential to limit the amount of air and water that can enter while increasing the drying rate of the wall assembly. That’s why choosing the best available weatherization system is key to a building’s durability.

DuPont™ Tyvek® building wraps give you the job-site durability, performance and ease of use needed to build more comfortable, longer-lasting and energy-efficient structures. Trusted by building professionals everywhere, DuPont™ Tyvek® building wraps, part of the complete DuPont™ Weatherization Systems portfolio, provide superior performance compared to ZIP System® wall sheathing (wood-based sheathing with a water-resistive overlay) as further described in this document.

DuPont™ Tyvek® building wraps deliver superior overall performance versus Zip System® wall sheathing in the following categories:

- Ease of installation
- Durability
- Water Resistance
- Drying of the wall system
- Air infiltration resistance

DuPont™ Tyvek® building wraps stand up to the construction job site and have been proven in residential and commercial construction for many years. DuPont products will continue to help protect buildings against air leakage and moisture damage by providing a combination of water resistance and wall-system drying capability for years to come.
**TYVEK® BUILDING WRAPS ARE EASIER TO INSTALL**

In its published sales literature, Huber Engineered Woods LLC, the manufacturer of Zip Systems® wall sheathing, claims its product installs 40% faster than the leading house wrap. However, in testing conducted by the NAHB Research Center, for DuPont, crews installed conventional sheathing followed by DuPont™ Tyvek® weatherization products, there was no discernible installation advantage for the Zip Systems® wall sheathing and tape. In fact, in some trials, crews installed the DuPont™ Tyvek® weatherization products faster. In those cases, the installation of the Zip Systems® wall sheathing took longer for the following reasons:

- Every seam—including all inside and outside corners—must be taped and then rolled
- Installers must maintain precisely a 1/8” gap on all seams before taping

Also, as directed in the Zip System® Installation Manual panels and tape can only be installed in dry conditions and on dry surfaces. This can lead to scheduling delays and added costs if weather doesn’t cooperate.

By comparison, DuPont™ Tyvek® Weatherization Systems can be installed under most weather conditions with as few as 4 fasteners per square yard and the underlying conventional sheathing materials can be installed more quickly because every seam and corner does not have to be taped and rolled. The air and water protection is provided by DuPont™ Tyvek® Weatherization Systems, and the spacing requirements for the wall sheathing are less precise.

**ZIP SYSTEM® WALL SHEATHING AND SEAM TAPE ARE MORE DIFFICULT TO INSTALL**

The performance of ZIP System® Wall Sheathing as an air and water barrier is dependent on the performance of the taped seams. Proper tape installation is time-consuming, complicated and crucial to the water and air resistance of the system. Published Zip System installation guidelines require that all ZIP System® seam tape edges must be sealed and the tape must be centered within +/- 1/2” of all panel edge seam centers—with no wrinkles in the applied tape. For best results, the substrate must be clean and dry.

However, installation crews participating in the NAHB test reported that the seam tape doesn’t stretch which can make it difficult to get full adhesion when taping corner joints. Inside corners were especially difficult to tape properly. As a result, inside corner joints could be improperly taped, or sometimes “overlooked”, providing spaces where air and water can enter the wall system.

The Zip System® installation manual requires a 1/8” gap between Zip System® panels to allow for expansion and contraction. Not maintaining the 1/8” gap can stress the bond between the tape and the Zip System® panel or between the kraft paper overlay and the OSB, causing either bond to fail as the panels expand and contract creating more opportunities for air infiltration, water intrusion and possible tape failure.

Also, each 4’ x 8’ piece of Zip System® Wall Sheathing requires 52 fasteners, each of which must puncture the WRB overlay. Maintaining the required pneumatic pressure is critical to the proper installation of the Zip System® panels, and fluctuating compressor pressure can make this difficult. Over-driving of fasteners can puncture the weather barrier overlay around the fastener, creating additional opportunities for water intrusion.

Over-driven nails cause damage to the WRB overlay of the Zip System®, creating opportunities for air and moisture to enter the wall system. (Photo Source: Parksite)

Inside and outside corners are problem areas with Zip System®. If the Zip System® tape is not installed tightly in the corners or if these corners are dirty and wet, which can reduce tape adhesion, these areas can be open to air infiltration and water intrusion.

(Inside corner)

(Outside corner)
CREWS DEBUNK THE ZIP SYSTEM SUPERIOR SPEED OF INSTALLATION CLAIM

In independent testing conducted at The NAHB Research Center’s Observational Research Lab, five installation crews participated in a series of experiments devised to test the Zip System® manufacturer’s claims of easier, faster installation.

The Test
Each crew was timed while installing the Zip System® and the complete DuPont Tyvek® Weatherization System and sheathing. The tests were conducted on a framed two-story structure that included three standard double-hung and three round top windows.

The Results
• Crews installed sheathing, DuPont™ Tyvek® HomeWrap® and the necessary DuPont™ Flashing as fast or even faster than the Zip System®. The speed of installation varied based on the crew’s experience.

• When asked why the Zip System was more difficult to install, the crews cited the difficulty of maintaining the required 1/8” gap on all sides and problems keeping the tape aligned and properly adhered.

• Not only did installation of the Zip System® take longer in some of the trials, but damage from overdriven fasteners was also common. This damage was not addressed, so repair time did not factor in the crews’ recorded time.

• The crews also commented on how easy it was to install the DuPont™ Flashing Systems Products.

TEAR-RESISTANT TYVEK® BUILDING WRAPS STAND UP TO TOUGH CONDITIONS
DuPont™ Tyvek® building wraps are made from a strong, nonwoven material that resist tearing and puncturing, and easily withstand demanding job-site conditions. If DuPont™ Tyvek® building wraps do get punctured or torn during construction, smaller punctures or tears can be repaired quickly with DuPont™ Tyvek® Tape®. Larger tears or holes can simply be patched with a slightly larger piece of the same DuPont™ Tyvek® product secured along all edges with DuPont™ Tyvek® Tape as illustrated in DuPont™ Tyvek® WRB installation guidelines.

ZIP SYSTEM® PANELS MUST BE HANDLED WITH CARE
ZIP System® wall sheathing consists of an oriented strand board (OSB) structural panel with a resin-impregnated kraft paper overlay.

Care must be taken to protect the Zip System® wall sheathing from moisture prior to installation. Storage instructions in the Zip System installation manual require that the Zip System® panel bundles be stored off of the ground and “covered loosely with a waterproof protective material”. The manufacturer recommends these covers be anchored on top of the stack but away from the sides and bottom to allow for adequate air circulation. When high moisture conditions exist, the manufacturer also recommends cutting the stack binding to prevent further damage to the swollen panels. Failure to take these precautions could result in damage to the panel.

As shown in the following job site photos, when the WRB overlay of the ZIP System is damaged, the underlying water-sensitive sheathing material is also affected. Damaged areas must be carefully repaired and precisely taped to maintain the integrity of the wall system.

Rugged conditions on the job site often cause damage not only to the WRB overlay of the ZIP System, but to the underlying sheathing material as well. (Photo Source: Parksite)
TYVEK® BUILDING WRAPS DELIVER SUPERIOR WATER RESISTANCE

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

The bulk water hold-out capability of ZIP System® wall sheathing depends on the taping of all joints and corners. Improper taping can allow water to enter the system, reducing the performance and durability of both the WRB and the entire wall system.

ZIP System® wall panels are also vulnerable to water intrusion because the seams of the WRB and the seams of the Zip System® panels are completely aligned. This increases the possibility of allowing water to move directly into the wall cavity after a tape failure. With DuPont™ Tyvek® building wraps, when installed per DuPont installation guidelines, the seams of the wrap and the seams of the sheathing are properly shingled, directing water away from the sheathing.

ZIP SYSTEM® WALL SHEATHING REQUIRE REVERSES SHINGLING

The ZIP System® wall sheathing’s published installation details result in reverse shingling around windows, doors and other penetrations. This conflicts with major window manufacturers’ installation details that require proper shingling at the window head, presenting yet another opportunity for water to enter the wall system.

Proper taping is critical but can be difficult to achieve with the Zip System®. Gaps, wrinkles and air bubbles create opportunities for water to enter the wall system. (Photo Source: Parksite)

When tested for dimensional stability and the integrity of the WRB overlay along the edge, ZIP System® wall sheathing samples exhibited partial delamination and a permanent edge swell of 16%. Tests were conducted by DuPont researchers per ASTM D2065, the test method used to predict the performance of composite wood products during exterior exposure.

TYVEK® BUILDING WRAPS PROMOTE FASTER DRYING

To be considered vapor permeable, a WRB must have a vapor permeance of at least 5 perms (IRC), or 10 perms (IBC), as tested per ASTM E96 B (desiccant method). Materials with a vapor permeance below these required levels significantly decrease the wall system’s ability to dry. DuPont™ Tyvek® building wraps have permeability ratings ranging from 28 to 56 perms giving the wall system better drying capability.

ZIP SYSTEM® WALL SHEATHING MAY CONTRIBUTE TO TRAPPING MOISTURE

The manufacturer of the Zip System claims vapor permeability of 12-16 perms for the WRB overlay only. However third-party laboratory testing of the vapor permeability of ZIP System® wall sheathing with the bonded WRB overlay shows that it has vapor permeability of 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. An exterior vapor barrier significantly reduces drying capability of the wall when moisture enters the system. It can also lead to condensation in the wall during cold weather.

**TYVEK® BUILDING WRAPS CONTRIBUTE TO ENERGY EFFICIENCY**
DuPont™ Tyvek® building wraps meet Sections R402.4 and C402.4 of the 2012 International Energy Conservation Code as well as the 2009 IECC. These sections require air sealing methods that allow for expansion and contraction of building materials. Sealing with a wrap system is more forgiving to the movement of sheathing materials.

When installed as an air barrier, DuPont™ Tyvek® building wraps help reduce energy consumption and contribute to sustainable building designs:

- DuPont™ Tyvek® building wraps are “Green Approved” to meet requirements of the ICC 700-2008 National Green Building Standard™.
- DuPont™ Tyvek® building wraps can contribute to LEED® credits in several categories, including improved energy efficiency and indoor air quality.
- DuPont™ Tyvek® building wraps help meet ENERGY STAR® Thermal Bypass Checklist requirements.
- Meet ASTM E1677 Type 1 and qualify as an “air-retarding wrap” for the California Energy Commission (CEC) Title 24 Housewrap Credit.
- DuPont™ CommercialWrap® and CommercialWrap® D are Air Barrier Association of America (ABAA) Evaluated to meet ABAA, requirements as both air barrier materials, air barrier assemblies, and water-resistive barriers.

**CONCLUSION**
DuPont™ Tyvek® building wraps are highly tear- and UV-resistant products that can be installed faster and easier than the ZIP System®. DuPont™ Tyvek® weatherization products provide property owners and management groups with a system that is highly resistant to bulk water and air infiltration while allowing excellent wall system drying. The use of DuPont™ Tyvek® building wraps with today’s wide array of sheathing options results in a more durable and forgiving wall system when compared to current WRB-laminated wood sheathing products.

**SUPERIOR PRODUCTS, UNPARALLELED SUPPORT**

**1-800-44-TYVEK**
**WWW.WEATHERIZATION.TYVEK.COM**

**THE DUPONT™ BUILDING KNOWLEDGE CENTER**
The DuPont Building Knowledge Center is where DuPont building scientists and construction professionals evaluate solutions and collaborate on new ideas that will lead to building practices that will yield more energy efficient and durable structures. www.buildingknowledge.dupont.com

**DUPONT™ TYVEK® SPECIALIST NETWORK**
DuPont™ Tyvek® WRBs are backed by more than 25 years of innovative building science and a national group of highly trained field representatives who are available to assist you with your installations of DuPont™ Tyvek® weatherization products. 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 on DuPont products in order to help you 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 for DuPont™ Tyvek® weatherization products 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 also offers a 10-Year Limited Warranty on certain products. Please refer to www.weatherization.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.

**1-800-44-Tyvek**
**WWW.WEATHERIZATION.TYVEK.COM**
DUPONT™ TYVEK® BUILDING WRAPS VS. ZIP SYSTEM® WALL SHEATHING

For more information, please call 1-800-44-Tyvek or visit www.weatherization.tyvek.com