Single-Family User's Bulletin for Installation of DuPont Building Envelope Solutions Products

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Introduction

Use of This Single-Family Residential User's Bulletin

This user bulletin is designed to serve as a resource for building professionals and installers using DuPont Building Envelope Solutions products in Single-Family Residential applications. It does not override or change requirements in the Installation Guidelines or Warranties and should be used in conjunction with these documents. Always refer back to the applicable Installation Guidelines and Warranties, available at building.dupont.com, for complete information.

This bulletin applies to single-family residential applications. See the *Multi-Family User's Bulletin for Installation of DuPont-Building Envelope Solutions Products* for information on multifamily applications including townhomes, mixed-use apartment buildings, high rise apartment buildings, or other buildings for residential-use as defined by the International Building Code (IBC).

This document will help builders, installers, and other construction professionals understand appropriate product application, proper installation, and warranty requirements when using DuPont Building Envelope Solutions.

DuPont Residential Single-Family Definition

Single-family residential buildings are defined in the Warranty as fully-detached one or two family structures, as well as townhouse structures not more than three stories above grade plane as defined in the 2018 International Residential Code (IRC) section R101.2, both to the extent they are exclusively Residential-Use building structures. This distinction differs from multi-family applications which includes townhomes over three stories, mixed-use apartment buildings, high rise apartment buildings, or other buildings for residential-use as defined by the International Building Code (IBC).

Product installation for residential single-family homes is described in the <u>DuPont</u>™ <u>Tyvek</u>® <u>Water-Resistive and Air Barriers</u> (WRB) and <u>DuPont Self-Adhered Flashing Products Installation</u> <u>Guidelines – Windows and Doors Installed AFTER the Tyvek</u>® <u>WRB (for Single-Family Buildings)</u>

Applicable Products and Product Descriptions for Single-Family Residential Buildings

Applicable DuPont Building Envelope Solutions Products include Tyvek® Water-Resitive and Air Barriers (WRBs), DuPont Self-Adhered Flashing Products, DuPont™ Tyvek® Fluid Applied Products, and installation accessories such as fasteners, seam tape, primers, and sealants. Below is a description of each DuPont Building Envelope Solutions Product that can be used as part of the complete building envelope.

DuPont™ Tyvek® Water-Resistive and Air Barriers (WRBs)

DuPont™ Tyvek® WRBs are made from a tough, spunbonded polyethylene breathable membrane with microscopic pores that resist air penetration while allowing moisture vapor to pass through. When properly installed, these materials also act as a secondary barrier to bulk water that may penetrate the exterior plane to reduce the likelihood of mold/rot/degradation and include:

- DuPont™ Tyvek® HomeWrap® Helps prevent air and water infiltration but allows water vapor to escape to help prevent rot and mold inside walls. Tyvek® HomeWrap® offers a drainage efficiency >90% per ASTM E2273, Standard Test Method for Determining the Drainage Efficiency of Exterior Insulation and Finish Systems (EIFS) Clad Wall Assemblies.
- DuPont™ Tyvek® StuccoWrap® Used in applications with a two layer WRB system for traditional stucco or as a single WRB for EIFS applications. Designed with a grooved texture to provide enhanced drainage and offers a drainage efficiency of >98% per ASTM E2273.
- **DuPont**™ **Tyvek**® **DrainWrap**™ Designed with a grooved texture to provide enhanced drainage and offers a drainage efficiency of >98% per ASTM E2273.
- DuPont™ Tyvek® ThermaWrap™ LE Designed with a metallized, low-emission (low-e) surface that reflects solar radiation away from the building to help improve energy efficiency.
- DuPont™ Tyvek® CommercialWrap® Designed for Commercial applications with increased durability, resistance to air, water, and UV exposure and offers a drainage efficiency of >90% per ASTM E2273.
- DuPont[™] Tyvek[®] CommercialWrap[®] D Designed for Commercial applications with increased durability, resistance to air, water, and UV exposure. The grooved texture provides enhanced drainage of > 98% per ASTM E2273.

While DuPont™ Tyvek® CommercialWrap® and DuPont™ Tyvek® CommercialWrap® D can be used for single-family residential applications, they are typically used on high performance commercial projects.

DuPont Self-Adhered Flashing Products

DuPont Self-Adhered Flashing Products work with DuPont™ Tyvek® WRBs to help seal the building envelope. The flashing is made from a butyl adhesive that performs through extreme temperatures, adheres to most common building materials, and contains no asphalt.

- **DuPont**[™] **FlexWrap**[™] A moldable and formable self-adhered flashing used for sill applications and round-top windows.
- DuPont[™] FlexWrap[™] EZ A formable self-adhered flashing specifically designed to seal wall penetrations such as pipes, electrical boxes, vents, or wires.

- **DuPont**[™] **Flashing Tape** A self-adhered flashing membrane used for heads and jambs of rectangular windows and doors.
- **DuPont**[™] **StraightFlash**[™] A self-adhered flashing used for heads and jambs of rectangular windows and doors.
- **DuPont™ VersaFlange™** A self-adhered flashing with a versatile flange used for PTAC units, brick mold and non-flanged windows and doors.

DuPont Building Envelope Solutions Installation Accessories

DuPont offers a number of accessory products that work with DuPont™ Tyvek® WRBs and DuPont Self-Adhered Flashing Products to provide superior air and water barrier protection for durable, energy-efficient homes.

- DuPont[™] Tyvek[®] Wrap Cap Fasteners (nails, screws, staples) –
 Designed to increase holding power and help reduce tears
 when fastening DuPont Building Envelope Solutions Products.
- DuPont[™] Tyvek[®] Tape Used for sealing the seams of Tyvek[®]
 WRBs to help provide a continuous barrier against air and
 water infiltration.
- Tower® Residential Sealant (formerly DuPont™ Residential Sealant) – A urethane modified acrylic, formulated to bond with DuPont Tyvek Building Envelope Solutions Products.
- Great Stuff Pro[™] Window & Door Polyurethane Foam Sealant –
 A low-pressure, flexible polyurethane foam sealant specifically
 formulated to seal gaps between window and door frames.

Additional information about these and other products such as $DuPont^{m}$ Tyvek® $Protec^{m}$ and $DuPont^{m}$ RainVent m Battens are included in the following tables.

DuPont™ Tyvek® Water-Resistive and Air Barriers (Tyvek® WRBs)

Product	Dimensions	Area
DuPont [™] Tyvek [®] HomeWrap [®]	3 ft x 100 ft	300 sq ft
	3 ft x 165 ft	495 sq ft
	5 ft x 200 ft	1,000 sq ft
	9 ft x 100 ft	900 sq ft
	9 ft x 150 ft	1,350 sq ft
	10 ft x 100 ft	1,000 sq ft
DuPont™ Tyvek® StuccoWrap®	5 ft x 200 ft	1,000 sq ft
DuPont [™] Tyvek [®] DrainWrap [™]	9 ft x 125 ft	1,125 sq ft
	10 ft x 125 ft	1,250 sq ft
DuPont [™] Tyvek [®] ThermaWrap [®] LE	5 ft x 150 ft	750 sq ft
	9 ft x 100 ft	900 sq ft
DuPont™ Tyvek° CommercialWrap°	5 ft x 200 ft	1,000 sq ft
	10 ft x 125 ft	1,250 sq ft
DuPont™ Tyvek®	5 ft x 200 ft	1,000 sq ft
CommercialWrap® D	10 ft x 125 ft	1,250 sq ft

DuPont Self-Adhered Flashing Products

Product	Width
DuPont™ FlexWrap™	6 in
	9 in
DuPont™ FlexWrap™ EZ	2.75 in
DuPont [™] StraightFlash [™]	4 in
	9 in
DuPont [™] VersaFlange [™]	6 in
DuPont™ Flashing Tape	4 in
	6 in
	9 in
	12 in

Installation Accessories

Product	Туре	Quantity	
	2 in Bulk Pack	6 rolls/	
DuPont [™] Tyvek® Tape	3 in Bulk Pack	bulk pack	
DuPont™ Tyvek® Metallized Tape	2 in x 100 ft Rolls	12 rolls/case	
DuPont™ Tyvek® Wrap Cap Staples or other cap staples for Stinger® Cap Stapler	Available in 7/8 in, 1-1/4 in, and 1-1/2 in lengths	2,000/box	
	3/8 in length	2,016/box	
DuPont™ Tyvek® Wrap Cap Nails	1 in electro-galvanized ring shank nail	2,000/box	
DuPont [™] Tyvek [®] Wrap Cap Screws	2 in Wrap Cap Screws	1,000/box	
DuPont™ Tyvek® DrainVent™ Rainscreen	4 ft x 50 ft roll		
DuPont™ RainVent™ Battens	5/8 in x 3/8 in x 8 ft	40/pack	
Great Stuff Pro™ Window & Door Polyurethane Foam Sealant	Can (reusable dispensing gun sold separately)	20 oz	
Great Stuff Pro™ Gaps & Cracks Polyurethane Foam Sealant	Can (reusable dispensing gun sold separately)	20 oz	
Tower® Residential Sealant (formerly DuPont™ Residential Sealant)	-	-	
TRUFAST® Walls Grip-Deck® screws with Thermal-Grip FastCap™ washers (TRUFAST® Walls formerly Rodenhouse)			

DuPont™ Tyvek® Protec™ Engineered Synthetic Roofing Underlayments

Product	UV Exposure	Roll Size	Roll Weight
DuPont [™] Tyvek [®] Roof Protector [™]	3 Months	42"x286'	20 lbs
Tyvek® Protec™ 120	3 Months	48"x250'	25 lbs
Tyvek® Protec™ 160	6 Months	48"x250'	31 lbs
Tyvek® Protec™ 200	6 Months	48"x250'	36 lbs

General DuPont™ Tyvek® WRB and Flashings Systems Installation Principles

The primary elements of proper weather barrier system installation for building envelopes are continuity, overlap, and fastening.

- Continuity refers to establishing a continuous barrier to help prevent bulk moisture from penetrating the wall system, to help direct bulk moisture out of the wall system, and to help prevent air leakage from entering the building and affecting the building's energy efficiency. Continuity encompasses taping seams, proper terminations at the roof-wall interface and the wall-to-foundation interface, and appropriate details at all penetrations, windows, doors, pipes, ducts, etc.
- Overlap refers to the proper shingling of the building envelope components on the wall. Much in the same way shingles are installed on a roof, it is important that the weather barrier membrane and flashing be properly overlapped so bulk water is directed down and away from the wall.
- Cap Fasteners are important for both overall durability of the weather barrier system, and also for reducing the potential for water penetration or air leakage at fastening points.

If these basic principles are compromised, bulk water may enter the wall system and cause damage over time. The areas around windows or other wall penetrations are extremely vulnerable. Therefore, proper window and door flashing and integration with the WRB is critical to water management. The plane where the WRB is placed is considered the drainage plane, and windows and doors should be flashed in a method that enables water to shed to the exterior of the drainage plane.

DuPont™ FlexWrap™ offers protection at the sill (and head, where applicable) when installed per the guidance in the applicable Installation Guidelines. This product is installed at the sill/head to protect the vulnerable corners where water damage is most likely to occur. Installing head and jamb flashing with DuPont™ Flashing Tape or DuPont™ StraightFlash™ after integral flanged windows are installed helps provide proper continuity between the window flange and the Tyvek® WRB or sheathing. In this method, the window flange at the sill is not sealed to the WRB/sill flashing to provide a mechanism for water to drain to the exterior should it penetrate the drainage plane and accumulate at the sill.

The same approach is used for non-flanged windows, such as brick mold installations, where DuPont™ FlexWrap™ is first installed at the sill prior to installing the window. In this case, DuPont™ VersaFlange™ is installed directly to the brick mold at the window jambs and head prior to window installation in order to create a flange on the window that can be subsequently integrated to the sheathing and DuPont™ Tyvek® WRB to establish contin-uity of the drainage plane. Alternatively, there is the option to address storefront/non-flanged window and door conditions using the "wrap the cavity" method in which the entire rough opening is sealed with flashing prior to the window or door installation.

The ability to design a continuous and durable air barrier plane despite transitions such as roof assemblies intersecting exterior walls, windows, and other service penetrations ultimately contributes to the air leakage of the whole building. DuPont offers the components necessary to construct an exterior air barrier assembly which includes a collection of compatible products that can be tied together to provide air tightness for the whole building enclosure.

An airtight building helps prevent cold air infiltration in the winter months, and moist warm air infiltration in the summer months. Tyvek® WRBs create an exterior air barrier that contributes to overall air tightness and energy efficiency and helps the conditioned air to stay inside of the building, minimizing energy loss. Each of the Tyvek® WRB Installation Guidelines provide requirements for air barrier installations.

DuPont Building Envelope Solutions Installation Guidelines and Warranty Considerations

Product installation considerations for both the Tyvek® WRB and the DuPont Self-Adhered Flashing Products for single-family residential buildings are covered in the DuPont™ Tyvek® Water-Resistive and Air Barriers (WRB) and DuPont Self-Adhered Flashing Products Installation Guidelines For Single-Family Residential Buildings documents. There are two versions of the document to cover when the Tyvek® WRB is installed in relation to the DuPont Self-Adhered Flashing Products at windows and doors:

- Windows and Doors Installed AFTER the Tyvek® WRB
- Windows and Doors Installed BEFORE the Tyvek® WRB

Overview of DuPont Installation Guidelines and Performance Requirements

The following paragraphs reference specific performance test standards. For more information regarding these standards, see the *Building Envelope Performance Requirements* section within this document. DuPont categorizes structures into three primary groups:

"Single-Family Residential Buildings" are defined as fully-detached one- or two-family structures, as well as townhouse structures not more than three stories above grade plane as defined in the 2018 International Residential Code (IRC) Section R101.2, both to the extent they are exclusively Residential Use building structures.

"Wood-Framed Multi-Family and Light Commercial Buildings" are defined by DuPont as the following (must meet ALL criteria):

- Constructed of wood-based structural exterior framing of Type III or Type V Construction* (IBC Chapter 6); and
- b. Does not exceed 2018 IBC max height (Table 504.3) for Type V construction (70 ft.) or Type III construction (85 ft.), including allowances for Automatic Sprinkler height increase (IBC 504.1 and Table 504.4) and 'podium' structures outlined in the Special Provisions* (IBC Section 510); and
- c. Design requirements for the building envelope do not exceed air barrier performance of ASTM E1677 (10.8 psf structural load, 65 mph equivalent wind load), and water infiltration resistance criteria of 6.24 psf (50 mph equivalent wind-driven rain) when tested in accordance with ASTM E331, ASTM E1105, or equivalent

*Special Provisions (IBC Section 510) allows for a "horizontal building separation", or 'podium', to be built under the wood-framed Type III or Type V building. The podium is typically constructed of steel framing or concrete. Podium-style buildings are included under "Wood-Framed Multi-Family and Light Commercial Buildings", as long as all other definition criteria (a. through c. above) are met.

"Commercial and High-Performance Buildings of Any Height" are defined by DuPont as any of the following:

- a. Structures constructed of steel-based structural exterior framing and any exterior sheathing, or
- b. Structures with exterior above grade walls constructed of concrete or concrete masonry units (CMU), or
- c. Structures of any height and construction type (including any framing type) that are designated as high-performance. "High-performance" is defined as air barrier performance exceeding ASTM E1677 and/or water infiltration resistance criteria exceeding 6.24 psf when tested in accordance with ASTM E331, ASTM E1105, or equivalent.

NOTE: "Podium" style structures with wood-framed floors built above steel-framed or concrete/CMU floors are covered under "Wood-Framed Multi-Family and Light Commercial Buildings" unless they are "high-performance".

Overview of Warranty Requirements

In addition to the criteria based on building type and performance, there are requirements for Warranty eligibility that also must be met in the <u>DuPont Building Envelope</u> <u>Solutions Products 10-Year Limited Warranty for Single-Family, Wood-Framed Multi-Family, and Light Commercial Buildings.</u> This Warranty follows the definitions outlined for building type and performance in the section above.

Both the Product Warranty and the Product and Labor Warranty offered by DuPont are Limited Warranties effective for a period of 10 years. The Product Warranty covers repair or replacement of defective DuPont Building Envelope Solutions Products only and does not cover repair and replacement of other damaged materials. In addition to replacement of defective weather barrier materials, the Product and Labor Warranty covers reasonable construction repair costs to correct any problem that arises solely out of the failure of the applicable DuPont Building Envelope Solutions Product.

The DuPont 10-Year Limited Warranties are directly tied to the DuPont Installation Guidelines. The applicable Installation Guidelines must be followed in order to be eligible for the Product and Labor component of the DuPont Building Envelope Solutions Products 10-Year Limited Warranty for Single-Family, Wood-Framed Multi-Family, and Light Commercial Buildings. This section provides guidance on choosing the applicable Installation Guideline and installation details for eligibility for both the Product and Labor Components of the 10-Year Limited Warranties.

DuPont Building Envelope Solutions Products Installation Considerations Single-Family Residential Buildings

The following table provides a summary of typical installation information.

Installation Considerations	Non-Air Barrier Installations (water details only)	Air Barrier Installations	
Tyvek® WRB¹	DuPont [™] Tyvek [®] HomeWrap [®] , Tyvek [®] DrainWrap [™] . Tyvek [®] StuccoWrap [®] , Tyvek [®] CommercialWrap [®] , Tyvek [®] CommercialWrap [®] D		
DuPont [™] Tyvek [®] Fluid Applied Products	Can be used on any above grade exterior wall where specified in hybrid details in this guide. Recommended for use on above grade exterior CMU and/or concrete walls. Refer to the Installation Guidelines for DuPont Tyvek Fluid Applied Flashing and/or Tyvek Fluid Applied WB+ for additional information		
DuPont [™] Tyvek® Tape	2" (3" required when using Tyvek® DrainWrap™, Tyvek® StuccoWrap®, or Tyvek® CommercialWrap® D)		
Typical Recommended Fasteners and Spacing ¹	1" DuPont™ Tyvek® Wrap Cap Staples or Nails (or equivalent) fastened along stud lines spaced at 6–18" vertically		
Tyvek® WRB Top of Wall Terminations	Skip-sealing along top of wall using Tower [®] Residential Sealant or Tyvek[®] Tape	Full seal along top of wall using Tower® Residential Sealant or Tyvek® Tape	
Tyvek* WRB Bottom of Wall Terminations	Skip-sealing along bottom of wall using Tower® Residential Sealant or Tyvek® Tape	Full seal along bottom of wall using Tower® Residential Sealant or Tyvek® Tape	
Recommended Windows/Door Head Flap Treatment	Skip-sealing along horizontal edge using Tyvek * Tape is acceptable	Full seal along horizontal edge and 45° cuts using Tyvek * Tape	

For increased holding power and for higher air and water holdout performance, DuPont recommends fasteners of sufficient length to penetrate securely into the stud. Temporary fastening methods can be used. See *Temporary Fastening* section of Installation Guidelines for more information.

In order to be eligible for the Product and Labor components of the Warranty, DuPont Building Envelope Solutions Products must be used in "all applicable areas" of the structure, as indicated in the Installation Guidelines. For example, if a combination of DuPont™ Tyvek® WRBs and other manufacturer's building wraps were used on the same building, the building would not be eligible for the Product and Labor components of the Warranty. One exception that highlights the definition of "all applicable areas" is a building with a combination of Exterior Insulation Finish Systems (EIFS) cladding and at least one other type of cladding. EIFS manufacturers often require the use of a specific WRB as a part of the EIFS system; therefore, Tyvek® WRBs would not be applicable behind these EIFS products. In the other areas of the building that do not have EIFS cladding, a Tyvek® WRB would be required on the remainder of the building for eligibility for the Product and Labor component of the Warranty.

If a building is constructed with a flashing detail not covered in the Installation Guidelines, general drainage principles should be used. The DuPont™ Tyvek® Specialist Network (described on page 7) is available to help evaluate whether a detail meets the criteria for the applicable DuPont Installation Guidelines. If there is any question regarding a detail and its compliance with the DuPont Installation Guidelines for Product and Labor Warranty eligibility, the Tyvek® Specialist should be contacted prior to installation of the DuPont Products.

The Warranty may cover only the Tyvek® WRB, or both the DuPont™ Tyvek® WRB Products and DuPont Self-Adhered Flashing Products. If applicable, the Warranty may also cover DuPont™ Tyvek® DrainVent™ Rainscreen or DuPont™ Tyvek® Fluid Applied Products installed as part of a hybrid detail.

In order to be eligible for the Product and Labor component of the Warranty for the Tyvek® WRB, the Tyvek® WRB must be installed in accordance with the applicable Installation Guidelines, including the proper overlap, shingling, taped seams, fasteners, fastener schedule, terminations, etc. and all other terms of the DuPont Building Envelope Solutions 10-Year Limited Warranty process must be followed.

For eligibility for the Product and Labor Warranty for the Tyvek® WRB specifically, DuPont Self-Adhered Flashing Products do not have to be used for flashing doors, windows, and/or other components that penetrate the DuPont™ Tyvek® Building Wrap as long as the alternate or competitive products meet the specifications set out in the DuPont Installation Guidelines.

- DuPont™ Tyvek® WRBs are not applicable under EIFS cladding.

In order to be eligible for the Product and Labor component of the Warranty for the DuPont Self-Adhered Flashing Products, DuPont™ Tyvek® Building Wrap Products must be used and installed in accordance with the applicable Installation Guidelines. The DuPont Self-Adhered Flashing Products must be installed in accordance with the applicable Installation Guidelines and all other terms of the DuPont Building Envelope Solutions 10-Year Limited Warranty process must be followed.

DuPont™ Tyvek® WRB Selection

When considering the Product and Labor component of the Warranty, DuPont™ Tyvek® HomeWrap®, DuPont™ Tyvek® StuccoWrap®, DuPont™ Tyvek® DrainWrap™ are typically used when following the Installation Guidelines for Single-Family Residential Buildings. DuPont™ Tyvek® CommercialWrap® and DuPont™ Tyvek® CommercialWrap® D can be used with any of the installation guidelines described above and for Warranty eligibility, but these products are typically used on high performance commercial products and follow the Installation Guidelines for Buildings Greater than 4 Stories and High Performance Installations of any Height.

Air Barrier Installation

The Home Energy Rating System (HERS) Index is a common industry method of rating the energy efficiency of new and existing homes. As a part of the HERS Index rating process, a blower door test is completed, which determines the air tightness of a home. As air tightness of a home increases, the home's energy efficiency will increase, resulting in a lower HERS Index Score. An air tight home prevents cold air infiltration in the winter months, and moist warm air infiltration in the summer months. DuPont™ Tyvek® WRBs create an exterior air barrier that contributes to overall air tightness and energy efficiency and helps the conditioned air to stay inside of the home, minimizing energy loss.

Fastening

Fastening requirements differ based on the type of building in the applicable DuPont Installation Guidelines, both in type of fastener and in fastener spacing. Refer to the individual installation guidelines for the complete details.

The Installation Guidelines for Single-Family Residential Buildings were designed for nailable substrates, i.e. wood. The typical fastener for these guidelines is a 1" DuPont™ Tyvek® Wrap Cap Staple, Cap Nail or other manufacturer's equivalent cap fastener, 2" Tyvek® Wrap Cap Screws were designed to be used in combination with fiber-faced exterior gypsum sheathing and metal studs; however, they can also be used for wood framed/sheathed assemblies.

Alternative fasteners, such as cladding fasteners, brick ties or others, may also be used as a means as attachment. Flashing patches can be installed behind these fasteners for extra performance for air and water holdout, as described in the section above. In addition, temporary means of attachment are included in the Temporary Fastening section of each Installation Guideline. Temporary fasteners are sometimes installed due to the fact that the permanent fasteners - the cladding fasteners – will be installed very soon after. If temporary means of WRB attachment are used, it is important to note there is an increased risk of WRB blow off or damage of the WRB. Therefore, DuPont recommends installing the permanent fasteners as soon as practically possible. Temporary fastening methods can include adhesive/primer installed in vertical strips along stud lines, recommended fasteners installed at a reduced schedule, or other methods.

Finally, DuPont™ Tyvek® Wrap Cap Fasteners, or recommended fasteners, should not be installed where DuPont Self-Adhered Flashing Products or DuPont™ Tyvek® Tape will be applied to avoid interference with the adhesion of these products. Tyvek® Wrap Cap Fasteners, or recommended fasteners, can be installed over DuPont Self-Adhered Flashing Products.

Refer to the applicable Installation Guidelines for more information.

UV Exposure

For Warranty eligibility, DuPont requires DuPont™ Tyvek® HomeWrap®, Tyvek® DrainWrap™, Tyvek® StuccoWrap®, and Tyvek® ThermaWrap® LE be covered within 4 months (120 days) of installation. DuPont requires that DuPont™ Tyvek® CommercialWrap® and Tyvek® CommercialWrap® D be covered within 9 months (270 days) of installation. DuPont Self-Adhered Flashing Products also have a UV exposure limit. DuPont™ FlexWrap™ and DuPont™ StraightFlash™ should be covered within nine months (270 days) and DuPont™ Flashing Tape should be covered within four months (120 days).

Primer

Adverse weather conditions or cold temperatures (below 25°F, -4°C) may require use of a primer to promote adhesion of DuPont Self-Adhered Flashing Products to most common building materials. Concrete, masonry, and fiber faced exterior gypsum board require the use of a recommended adhesive/primer. Primer is not required when DuPont Self-Adhered Flashing Products are being applied to wood, except when there are cold temperatures as described above.

Refer to the Technical Bulletin <u>Chemical Compatibility or</u>
<u>Representative Building Sealants, DuPont™ Tyvek® Commercial</u>
<u>Building Envelope Solutions</u> for a list of approved primers.

Sealants

For information on sealants, refer to the Technical Bulletin Chemical Compatibility of Representative Building Sealants, DuPont[®] Tyvek[®] Commercial Building Envelope Solutions Products. In addition, the Technical Bulletin Adhesion Performance Reference Sheet DuPont[®] Tyvek[®] Fluid Applied Commercial Building Envelope Solutions Products contains information relating to both Tyvek[®] Fluid Applied Products and DuPont Self-Adhered Flashing Products.

Fluid Applied Products

DuPont offers a complete portfolio of fluid applied products: DuPont™ Tyvek® Fluid Applied WB+™ for a continuous weather barrier on a variety of wall systems, DuPont™ Tyvek® Fluid Applied Flashing & Joint Compound+ for complex detailing around fenestrations and penetrations, and DuPont™ Sealant for Tyvek® Fluid Applied System for interior perimeter seals around windows and other uses. These products can be applied to many substrates, including wood. Refer to the applicable Installation Guidelines for more details on DuPont™ Tyvek® Fluid Applied Products.

Installation Guidelines Applicability

There are a variety of DuPont™ Tyvek® WRB and Flashing Systems Installation Guidelines available for various conditions. Each of the guidelines, and a description of applicability, is below. Only the most relevant Installation Guidelines have been listed. Visit building.dupont.com for complete Installation Information offered by DuPont.

DuPont™ Tyvek® WRB and DuPont Self-Adhered Flashing Product Installation Guidelines

- DuPont™ Tyvek® Water-Resistive and Air Barriers (WRB) and DuPont Self-Adhered Flashing Products Installation Guidelines for Single-Family Residential Buildings, Windows and Doors Installed AFTER the Tyvek® WRB – Complete Installation Information for both the Tyvek® WRB and the DuPont Self-Adhered Flashing Products when windows and doors are installed AFTER the WRB.
- DuPont™ Tyvek® Water-Resistive and Air Barriers (WRB) and DuPont Self-Adhered Flashing Products Installation Guidelines for Single-Family Residential Buildings, Windows and Doors Installed BEFORE the Tyvek® WRB – Complete Installation Information for both the Tyvek® WRB and the DuPont Self-Adhered Flashing Products when windows and doors are installed BEFORE the WRB.
- Interior Air Barrier Installation Details: Interior Air Barrier and Interior Insulation Dam Describes methods for installing the Tyvek® WRB as an interior air barrier and interior insulation dam.
- Installation of Integral Flanged Windows with Wood Bump-Out Frame AFTER Water-Resistive Barrier (WRB) Is Installed – Describes methods for flashing windows that are installed onto a wood-bump out frame around the perimeter of the rough opening.
- Installation of Integral Flanged Windows in Recessed
 Openings AFTER Water-Resistive Barrier (WRB) Is Installed –
 Describes methods for installing windows into <u>shallow</u> and <u>deep recessed</u> window conditions AFTER the WRB has been installed. This condition is more common in the US Southwest.
- Installation of Integral Flanged Windows in Recessed
 Openings BEFORE Water-Resistive Barrier (WRB) Is Installed
 – Describes methods for installing windows into shallow and deep recessed window conditions BEFORE the WRB has been installed. This condition is more common in the US Southwest.
- <u>DuPont™ FlexWrap</u>™ <u>EZ Installation Information</u> Describes methods for sealing non-flanged wall penetrations such as small and large pipes, HVAC vents, electrical wires, etc.
- <u>DuPont™ Flashing Tape for Inside and Outside Wall Corners</u> –
 Describes methods for providing enhanced protection of both inside and outside corners created by intersecting walls using 12" wide DuPont™ Flashing Tape.

Assemblies with DuPont™ Tyvek® WRB and DuPont Exterior Continuous Insulation

• <u>Integrating DuPont Building Envelope Solutions Products</u> with DuPont Exterior Continuous Insulation

DuPont™ Tyvek® DrainVent™

• <u>DuPont[™] Tyvek[®] DrainVent[™] Rainscreen Installation Guidelines</u>

Educational Materials

Building Science Bulletins and Articles

- Understanding Vapor Permeability
- <u>DuPont</u>[™] <u>Tyvek</u>[®] <u>HomeWrap</u>[®]
- <u>DuPont™ Tyvek® StuccoWrap®: Better Drainage Means</u>
 <u>Stronger Stucco</u>
- <u>Chemical Compatibility of Representative Building Sealants,</u> <u>DuPont™ Tyvek® Commercial Weatherization Systems Products</u>
- <u>Adhesion Performance Reference Sheet DuPont™ Tyvek® Fluid</u>
 <u>Applied Commercial Weatherization Systems Products</u>
- Drainage Efficiency of DuPont[™] Tyvek[®] HomeWrap[®] and DuPont[™] Tyvek[®] CommercialWrap[®]
- The Use of DuPont[™] Tyvek[®] WRBs over Coated Sheathing Products

Additional Resources

DuPont™ Tyvek® Specialist Network

The DuPont™ Tyvek® Specialist Network is an elite team of more than 160 highly-trained field representatives dedicated to keeping up with trends and supporting installations before, during and after construction. From the latest updates on building codes to keeping up with current challenges, local DuPont™ Tyvek® Specialists can provide on-site consulting and training to help make sure the job gets done right.

DuPont™ Tyvek® Certified Installers

DuPont offers a program to train installers on the basics of building science, product knowledge, and proper installation of DuPont Building Envelope Solutions Products. These installers receive classroom and on-site training on proper installation techniques and safety practices from a DuPont™ Tyvek® Specialist and must pass written and hands-on installation tests to become part of the Certified Installer network.

- · Residential Certified Installer training
- · Commercial Certified Installer training
- DuPont[™] Tyvek[®] Fluid Applied Products Certified Installer training

Building Envelope CEU: AIA/CES Learning Units

DuPont is a participant in the American Institute of Architects' Continuing Education Systems (AIA/CES) Registered Provider program and offers a range of AIA/CES Learning Units designed to help building professionals stay up-to-date on best building practices and specifications. These units cover a wide range of weatherization-related topics, ranging from Better Design of Buildings to Moisture Management Systems Review to Commonly Made Energy Mistakes. Within the AIA/CES system, a Learning Unit (LU) is earned for each 60-minute increment of instruction or study. A Continuing Education Unit (CEU) is earned for each 10 hours of instruction or study. Each of these CEUs can be presented by your local Tyvek® Specialists

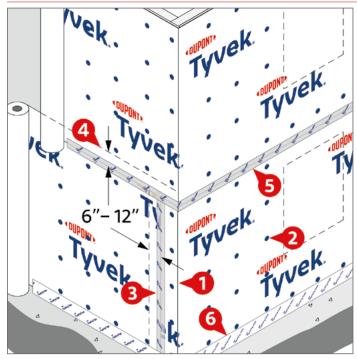
Single-Family Field Installation Examples: DuPont™ Tyvek® WRB Installation and Continuity





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Tyvek® WRB Installation for New Construction

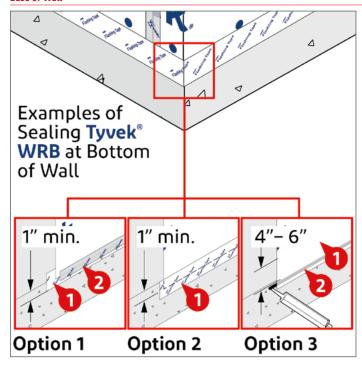


- Tyvek® WRB roll aligned at bottom corner of structure and unrolled starting at corner and directly over window/door rough openings. All vertical seams overlapped by 6"-12".
- 2. **Tyvek® WRB** secured to stud or nail-base material with recommended fasteners spaced 6"–18" on vertical stud lines. No fasteners within 6" of sills and jambs and 9" of the head of window/door rough openings.
- 3. Vertical seams of Tyvek® WRB taped with DuPont™ Tyvek® Tape.
- 4. Upper layer of $\textbf{Tyvek} ^{\texttt{@}} \textbf{WRB}$ installed overlapping bottom layer by min. $6^{\prime\prime}.$
- Air Barrier Installations: All horizontal seams taped. (3" Tyvek® Tape required on horizontal and vertical seams when using DuPont™ Tyvek® StuccoWrap®, Tyvek® DrainWrap™ or Tyvek® CommercialWrap® D).
- Air Barrier Installations: All terminations of the Tyvek® WRB (including, but not limited to, top-of-wall/bottom-of-wall interfaces) taped or sealed with Tyvek® Tape or DuPont Self-Adhered Flashing Products.

Recommended Fasteners (non-exhaustive list):

- DuPont™ Tyvek® Wrap Cap Nails, Screws, or Staples
- · Other cap staples for Stinger® Cap Stapler
- TRUFAST® Walls Grip-Deck® screws with Thermal-Grip FastCap™ washers (TRUFAST® Walls formerly Rodenhouse).

Base of Wall



Option 1

- Interface of sheathing and foundation sealed using DuPont Self-Adhered Flashing Product.
- Tyvek® WRB overlapped onto DuPont Self-Adhered Flashing Product min. 1" and terminated using Tyvek® Tape[1].

Option 2

 Tyvek® WRB overlap foundation min. 1" and sealed with DuPont Self-Adhered Flashing Product^[1].

Option 3

- 1. Ensure Tyvek® WRB overlaps foundation min 1".
- Apply a liberal bead of Tower® Residential Sealant, or recommend sealant, along top edge of foundation.
- 3. Overlap Tyvek® WRB over foundation and into sealant to seal
- [1] DuPont Self-Adhered Flashing Products with recommended adhesive/primer, or recommended primer as applicable when Tyvek® WRB sealed directly to gypsum sheathing, concrete, wood or other rough surfaces.

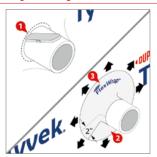
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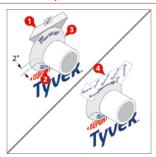


Sealing Non-Flanged Penetrations with DuPont™ FlexWrap™



Method 1

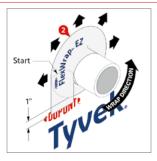
- 1. Tyvek® WRB cut around penetration.
- 2. **FlexWrap™** installed around bottom of penetration.
- FlexWrap™ installed around top of penetration, overlapping bottom layer of FlexWrap™ by 2" on either side.
- OPTIONAL: Piece of Tyvek® WRB taped over top of FlexWrap™ (not shown).



Method 2

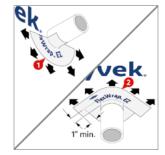
- 1. **Tyvek**® **WRB** cut around penetration with head flap cut above.
- 2. **FlexWrap™** installed around bottom of penetration.
- FlexWrap™ installed around top of penetration, overlapping bottom layer of FlexWrap™ by 2" on either side.
- Head flap sealed using Tyvek® Tape or DuPont Self-Adhered Flashing Products.

Sealing Penetrations with DuPont™ FlexWrap™ EZ



Outer Diameter GREATER than 2"

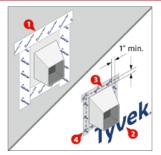
- FlexWrap™ EZ piece cut LONGER than the circumference of nonflanged product (ensure 1" overlap onto the Tyvek® WRB).
- FlexWrap™ EZ adhered around penetration, starting at the horizontal position on either side.



Outer Diameter LESS than 2"

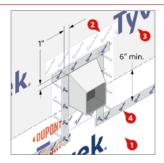
- FlexWrap™ EZ piece cut 1/2 the length of the circumference of the non-flanged product, adhered onto bottom section, and fanned out onto Tyvek® WRB.
- Second piece of FlexWrap™ EZ piece cut the length of the pipe circumference, adhered onto top section and fanned out onto face of wall with a min 1" overlap of the edges of the FlexWrap™ EZ below.

Flanged Penetration BEFORE Tyvek® WRB



Method 1

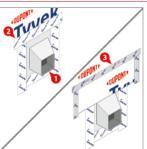
- DuPont™ Flashing Tape installed onto flanges extending onto sheathing by min. 2".
- 2. Tyvek $^{\! @}$ WRB installed on wall.
- Tyvek® WRB cut around penetration, ensuring min. 1" gap for adhesion.
- Edges of Tyvek® WRB sealed with DuPont™ Tyvek® Tape.



Method 2

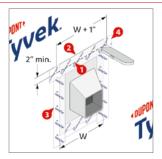
- Tyvek® WRB installed under bottom flange.
- DuPont™ Flashing Tape adhered onto sides and top flange.
- Next course of Tyvek® WRB installed with min. 6" overlap.
- Tyvek® WRB seams sealed with Tyvek® Tape.

Flanged Penetration AFTER Tyvek® WRB



Method 1

- 1. Integral flanged product installed.
- DuPont Self-Adhered Flashing Product or Tyvek® Tape installed onto bottom, sides, and top flanges, extending onto Tyvek® WRB min. 2".
- OPTIONAL: Tyvek® WRB piece installed to overlap the top edge of the DuPont Self-Adhered Flashing Product. Sides and top sealed with Tyvek® Tape.



Method 2

- Horizontal cut min. 1" wider than the flange.
- Top flange slid into slit with min. 2" overlap of Tyvek® WRB.
- DuPont Self-Adhered Flashing Product (recommended best practice) or Tyvek® Tape adhered on bottom and side flanges, extending onto Tyvek® WRB by 2".
- DuPont Self-Adhered Flashing Product (recommended best practice) or Tyvek® Tape installed to top flange, extending BEYOND DuPont Self-Adhered Flashing Product, or Tyvek® Tape, on side flanges.

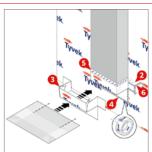
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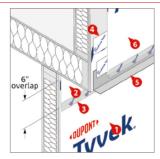


Wall Protrusion with Horizontal Plane



- Tyvek® WRB terminated below horizontal plane onto sheathing using DuPont Self-Adhered Flashing Product (not shown). Termination optional for horizontal planes 12" or less.
- At outside edge of cantilever, flap cut min. 6" above bottom edge of horizontal plane.
- Tyvek® WRB wrapped under horizontal plane and folded up the sides of wall protrusion min. 6".
- 4. All Tyvek® WRB seams sealed with DuPont™ Tyvek® Tape.
- Top edge of Tyvek® WRB sealed to the sheathing using DuPont™ Flashing Tape.
- Flap at outside edges of horizontal plane folded down and sealed with Tyvek® Tape.
- Upper course of Tyvek® WRB installed overlapping bottom layer min 6" (not shown).

Horizontal Plane Transition



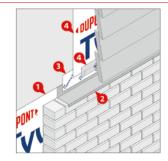
- Tyvek® WRB installed on wall below horizontal plane.
- 2. **Tyvek® WRB** installed on horizontal plane, overlapping the **Tyvek® WRB** below by 6", and extending min. 6" onto the vertical wall above.
- 3. **Tyvek® Tape** applied to seal horizontal seam below.
- DuPont™ Flashing Tape applied to terminate Tyvek® WRB onto sheathing above horizontal plane.
- OPTIONAL: Install a kick-out flashing and terminate vertical leg with DuPont™ Flashing Tape.
- Tyvek® WRB installed on wall above horizontal plane and terminated onto kick-out flashing with Tyvek® Tape or DuPont Self-Adhered Flashing Product.

Façade Transition



Option 1 Metal Flashing Sealed to Tyvek® WRB

- No Tyvek® WRB fasteners where metal flashing or DuPont Self-Adhered Flashing will be installed. "Z" or "L" metal flashing installed over lower façade and fastened onto Tyvek® WRB with mechanical fasteners.
- Vertical leg of metal flashing terminated to Tyvek® WRB with DuPont™ Flashing Tape or Tyvek® Tyvek Tape. When using DuPont™ Flashing Tape, ensure min. 2" adhesion to the WRB.



Option 2
Metal Flashing Sealed to Sheathing

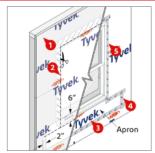
- First course of Tyvek® WRB installed with min. 2" extending BEYOND where top edge of the lower facade will be located.
- "Z" or "L" metal flashing applied over lower façade, even with top edge of Tyvek® WRB, and fastened with mechanical fasteners.
- Vertical leg of metal flashing terminated to sheathing with DuPont™ Flashing Tape with min. 2" adhesion onto sheathing.
- Next course of Tyvek® WRB installed with min. 2" overlap onto DuPont Self-Adhered Flashing Product. WRB terminated to self-adhered flashing using DuPont™ Tyvek® Tape.

Beam Penetration



- Tyvek® WRB installed across wall with top edge of WRB at bottom of beam.
- Two pieces of Tyvek® WRB installed on either side of beam and sealed with Tyvek® Tape. The two pieces extend min. 7" above top of beam and overlap lower WRB course min. 6"
- First piece of DuPont™ FlexWrap™ installed around bottom of penetration before second piece installed around top of penetration, overlapping bottom layer by 2".
- Tyvek® WRB installed above beam, overlapping lower courses with 1" gap above beam. All horizontal and vertical seams taped with Tyvek® Tape.

Integrating Tyvek® WRB for Windows/ Doors Installed **BEFORE** Tyvek® WRB



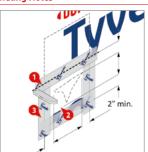
- Tyvek® WRB installed over window/ door. No fasteners within 4" of frame of window at jambs/head and within 12" at sill.
- Perimeter marked 1"- 2" from window at jambs/head and 6" below window at sill. Cut along marking to expose window. Slits cut at lower corners 1" - 2" BEYOND Tyvek® WRB apron underneath.
- Tyvek® WRB apron brought to the front through the cut/slits and lapped over top layer of Tyvek® WRB.
- 4. **Tyvek**® **WRB** apron sealed around perimeter with **Tyvek**® **Tape**.
- Tyvek® WRB terminated around window with Tyvek® Tape or DuPont Self-Adhered Flashing.

Handling Tears



 Tears covered with Tyvek® Tape or DuPont Self-Adhered Flashing Products.

Handling Holes



- 1. Slit in **Tyvek® WRB** cut 2" above hole and extending 2" on each side of hole.
- Piece of Tyvek® WRB tucked into the slit to maintain proper shingling.
- 3. Seams around **Tyvek® WRB** taped, working from bottom to top.

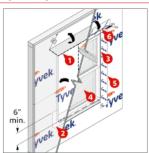
Single-Family Field Installation Examples: DuPont Self-Adhered Flashing Products (Installed AFTER DuPont™ Tyvek® WRB)

Tyvek.



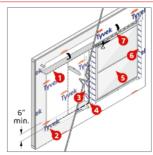
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Integral Flanged Window



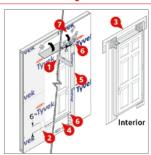
- "I-Cut" in Tyvek® WRB at rough openings. 45° cuts at window head extending min. 8" from outer corners. Flaps at jambs folded into the opening and secured. Head flap flipped up and secured.
- 2. **DuPont™ FlexWrap™** installed at the sill and min. 6" up jambs.
- Sealant applied to three sides of the window opening at jambs and head. OPTIONAL: Skip sealing at the sill for drainage.
- Window installed per manufacturer's specifications.
- 5. **DuPont™ Flashing Tape** applied over flanges at jambs and head.
- Head flap trimmed 1"- 2" and secured overhead flashing with DuPont™ Tyvek® Tape or DuPont Self-Adhered Flashing Product.
- 7. Full interior perimeter seal applied (not shown).

Integral Flanged Adjacent Windows



- "I-Cut" in Tyvek® WRB at rough openings. 45° cuts at window head extending min. 8" from outer corners. Flaps at jambs folded into the opening and secured. Head flap flipped up and secured.
- 2. **FlexWrap™** installed at each sill extending min. 6" up jambs.
- 9" DuPont™ Flashing Tape installed onto shared vertical framing; bottom edge aligned with sill, top edge aligned with head.
 - **NOTE**: For option using **Tyvek® WRB** at shared framing see full Single-Family Install Guides.
- Sealant applied to three sides of the window opening at jambs and head. OPTIONAL: Skip sealing at the sill for drainage.
- 5. Window installed per manufacturer's specifications.
- 6. **DuPont™ Flashing Tape** applied over flanges at jambs and head.
- Head flap trimmed 1"- 2" and secured over head flashing with Tyvek® Tape or DuPont Self-Adhered Flashing Products.
- 8. Full interior perimeter seal applied to both windows (not shown).

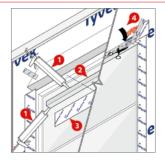
Non-Flanged Door using DuPont™ VersaFlange™



Method also applies to Non-flanged window, non-integral flanged window/door, and brick mold window/door.

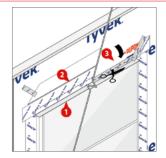
- "I-Cut" in Tyvek® WRB at rough openings. 45° cuts at window head extending min. 8" from outer corners. Flaps at jambs folded into the opening and secured. Head flap flipped up and secured.
- FlexWrap™ installed at sill extending min. 6" up jambs. Integrated back dam as applicable.
- VersaFlange[™] applied to door frame along jambs and head (head piece installed first). FlexWrap[™] pieces applied at corners.
- 4. **OPTIONAL**: For higher performance, high-pressure skirt installed to door frame prior to door installation.
- Release paper removed from VersaFlange™ and door installed per manufacturer's instructions.
- OPTIONAL: Exposed butyl covered with Tyvek® Tape or DuPont Self-Adhered Flashing Products.
- Head flap flipped down, trimmed 1"- 2", and sealed with Tyvek® Tape or DuPont Self-Adhered Flashing Products.
- 8. Full interior perimeter seal applied (not shown).

Drip Cap Installation for Windows and Doors



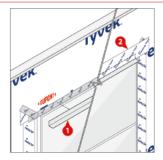
Option 1 Drip Cap Under Head Flap, Single Piece of Flashing — Requires Drip Cap Leg NOT Taller than Window Flange

- Sealant applied to both sides of drip cap.
- 2. Drip cap installed tight against window head flange.
- 3. **DuPont™ Flashing Tape** installed over drip cap and head flange.
- Head flap flipped down, trimmed 1" - 2", and sealed with Tyvek® Tape or DuPont Self-Adhered Flashing Products.



Option 2 Drip Cap Under Head Flap, Over Window Head Flashing

- 1. Drip cap installed tight against window head flange.
- DuPont™ Flashing Tape installed over drip cap top edge.
- Head flap flipped down, trimmed 1" - 2", and sealed with Tyvek® Tape or DuPont Self-Adhered Flashing Products.



Option 3 Drip Cap Over Head Flap

- Drip cap installed tight against window head flange.
- DuPont™ Flashing Tape installed over drip cap top edge.

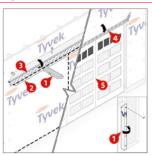
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Tyvek.



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Garage Doors



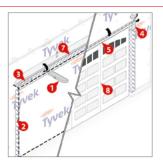
Option 1 Standard I-Cut with Drip Cap Sealed to Sheathing

- "I-Cut" in Tyvek® WRB at rough openings. 45° cuts at head of garage door frame extending min. 8" from outer corners. Flaps at jambs folded into the opening and secured. Head flap flipped up and secured.
- 2. Metal or vinyl drip cap installed.
- Head flange and top edge of the drip cap covered with a piece of DuPont™ Flashing Tape or DuPont™ StraightFlash™.
- Head flap trimmed 1"- 2" and secured overhead flashing with DuPont™ Tyvek® Tape or DuPont Self-Adhered Flashing Products.
- Garage door installed per manufacturer's installation instructions.



Option 2 I-Cut and Three-Piece Head Detail with Drip Cap Sealed Over Flashing

- "I-Cut" in Tyvek® WRB at rough openings. 45° cuts at head of garage door frame extending min. 8" from outer corners. Flaps at jambs folded into the opening and secured. Head flap flipped up and secured.
- DuPont™ Flashing Tape or StraightFlash™ installed first onto flat part of the head, then onto the sheathing on the face of the wall above.
- DuPont™ FlexWrap™ installed at the corners with at least 6" down the jamb and 6" onto the DuPont™ Flashing Tape along the head.
- 4. Metal or vinyl drip cap installed.
- Head flange and top edge of the drip cap covered with a piece of DuPont™ Flashing Tape or StraightFlash™.
- Head flap trimmed 1"- 2" and secured overhead flashing with Tyvek® Tape or DuPont Self-Adhered Flashing Products.
- Garage door installed per manufacturer's installation instructions.



Option 3 Flush Cut (O-Cut) and "Wrap the Cavity" Flashing Method with Drip Cap Sealed Over Flashing

- Tyvek® WRB cut using a square cut around the perimeter of the rough opening (not shown) and 45° at corners to create head flap.
- DuPont™ Flashing Tape DuPont™ or StraightFlash™ installed along the iambs.
- DuPont™ Flashing Tape or StraightFlash™ installed first onto flat part of the head, then onto the sheathing on the face of the wall above
- FlexWrap™ installed at the corners with at least 6" down the jamb and 6" onto the DuPont™ Flashing Tape along the head.
- 5. Metal or vinyl drip cap installed.
- Head flange and top edge of the drip cap covered with a piece of DuPont™ Flashing Tape or StraightFlash™.
- Head flap trimmed 1"- 2" and secured overhead flashing with Tyvek® Tape or DuPont Self-Adhered Flashing Products.
- Garage door installed per manufacturer's installation instructions.



For more information, contact your local DuPont™ Tyvek® Specialist, visit <u>building.dupont.com</u>, or call 1-833-338-7668

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