


Exterior Cladding

Presented by: Russell Thornburg
Friday pm - 3/15/2024

Wall Covering



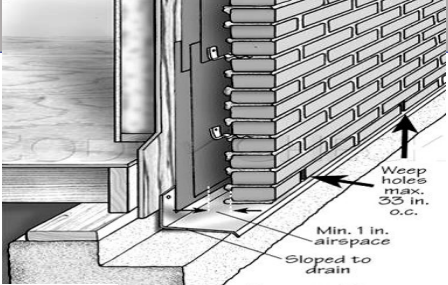
Section 703



Resource Materials

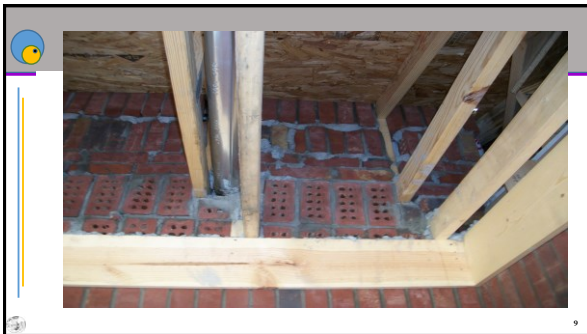
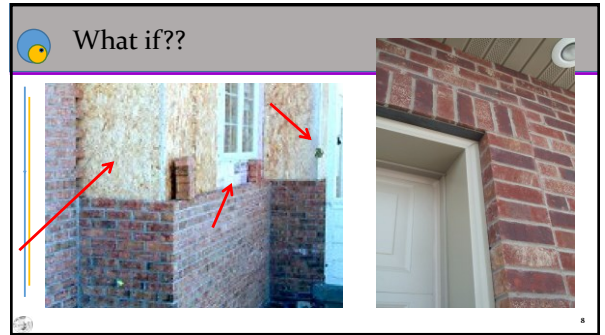
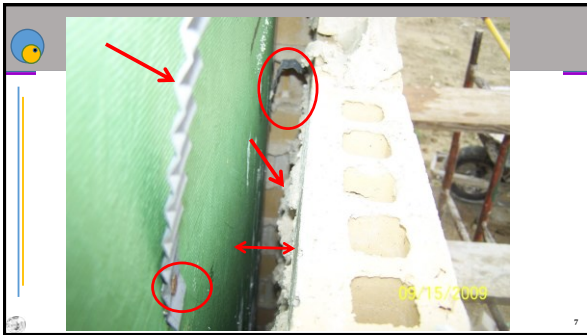


2021 Red Line Version is not out yet



Weep holes max. 33 in. o.c.
Min. 1 in. airspace
Sloped to drain
Masonry Veneer

Table R703.8.4(1), R703.8.4, R703.8.6, R703.2



Lintel Support - R703.7.2

TABLE R703.7 ALLOWABLE DEFLECTION OF STRUCTURAL MEMBERS¹⁾

STRUCTURAL MEMBER	ALLOWABLE DEFLECTION
Roofers having slopes greater than 3°/12 with no finished ceiling attached to rafters	L/180
Interior walls and partitions	H/180
Flashed roofings with plaster or stucco finish	L/360
All other structural members	L/240
Exterior walls—wind loads ²⁾ with plaster or exterior finish	H/360
Exterior walls with other brittle finishes	H/240
Exterior walls with flexible finishes	H/300 ³⁾
Lintels supporting masonry veneer walls ⁴⁾	L/600

1) The wind load shall be permitted to be taken as 0.7 times the Component and Cladding loads for the purpose of the determining deflection limits herein.
 2) For cantilever members, L shall be taken as twice the length of the cantilever.
 3) For aluminum structural members or panels used in roofs or walls of sunroom additions or patio covers, not supporting edge of glass or sandwich panels, the total load deflection shall not exceed L/50. For continuous aluminum structural members supporting edge of glass, the total load deflection shall not exceed L/75 for each glass lite or L/60 for the entire length of the member, whichever is more stringent. For sandwich panels used in roofs or walls of sunroom additions or patio covers, the total load deflection shall not exceed L/120.
 4) Deflection for exterior walls with interior gypsum board finish shall be limited to an allowable deflection of H/180.
 e. Refer to Section R703.7.2.

Wall Covering

- Use Table R703.7.3.1.
- Known values:
 - Angle size.
 - Stories.
- Use Table R703.7.3.1 for fireplace opening.

SIZE OF STEEL ANGLE ¹⁾	NO STORY ABOVE	ONE STORY ABOVE	TWO STORES ABOVE	NO. OF "L" OR EQUIVALENT MEMBERS OR BARS ²⁾
3 x 3 1/2	6'-0"	4'-0"	3'-0"	1
4 x 4 1/2	8'-0"	6'-0"	4'-0"	1
4 x 6 1/2	10'-0"	8'-0"	6'-0"	2
6 x 3 1/2 x 3/8	12'-0"	9'-0"	7'-0"	2
2.6 x 3 1/2 x 3/8	20'-0"	12'-0"	9'-0"	4

Water-Resistive Barrier

- Water-resistive barrier is required over wall sheathing behind brick veneer.
- Vertical joints, if staggered, shall be permitted to be away from studs if applied over wood structural panel sheathing.

Wall Covering

R703.7.4 Anchorage

Masonry veneer shall be anchored to the supporting wall with corrosion-resistant metal ties.

- A minimum 1 1/2" into mortar or grout
- Not less than 5/8" mortar or grout cover on the outside

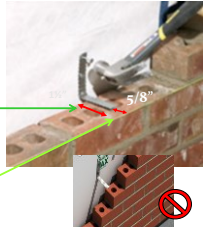


13

703.7.4: Masonry veneer anchorage

Masonry veneer shall be anchored to the supporting wall with corrosion-resistant metal ties:

- Minimum 1 1/2" into mortar or grout
- Minimum 5/8" mortar or grout cover on the outside



Insufficient embedment length

14

TABLE R703.8.4 TIE ATTACHMENT AND AIRSPACE REQUIREMENTS

BACKING AND TIE	MINIMUM TIE	MINIMUM TIE FASTENER*	AIR SPACE
Wood stud backing with corrugated sheet metal	22 U.S. gage (0.0299 in.) x 7/8 in. wide	8d common nail ^{1/2} (2 1/2 in. x 0.131 in.)	Nominal 1/2 in. between sheathing and veneer
Wood stud backing with metal strand wire	W1.7 (No. 9 U.S. gage; 0.148 in.) with hook embedded in mortar joint	8d common nail ^{1/2} (2 1/2 in. x 0.131 in.)	Minimum nominal 3/4 in. between sheathing and veneer Maximum 4 1/2 in. between backing and veneer
Cold-formed steel stud backing with adjustable metal strand wire	W1.7 (No. 9 U.S. gage; 0.148 in.) with hook embedded in mortar joint	No. 10 screw extending through the steel framing a minimum of three exposed threads	Minimum nominal 3/4 in. between sheathing and veneer Maximum 4 1/2 in. between backing and veneer



15

Wall Covering

A reminder:
Masonry veneer shall not support any vertical load other than the dead load of the veneer above.

You cannot attach to or through the veneer i.e.

- Decks
- Porches
- Roof loads

R703.7.3

16


Wall Covering

R703.12 Adhered masonry veneer

R703.12.1 Clearances.

✓ On exterior stud walls, adhered masonry veneer shall be installed:

1. Minimum of 4" above the earth;
2. Minimum of 2" above paved areas; **or**
3. Minimum of 1/2" above exterior walking surfaces which are supported by the same foundation that supports the exterior wall.



17

Wall Covering

R703.12.2 Flashing at foundation

- ✓ Corrosion-resistant screed **or**
- ✓ Flashing of a min. 0.019-inch **or**
- ✓ 26-gage galvanized **or**
- ✓ Plastic with a min. vertical attachment flange of 3 1/2" will be installed to extend min. 1" below the foundation plate line on exterior stud walls in accordance with Section R703.8.
- ✓ The water-resistive barrier, as required by Table R703.4, Footnote w, shall lap over the exterior of the attachment flange of the screed or flashing.

18



R703.14 Polypropylene siding

Warning: there is a product out there that looks very similar to vinyl siding that is not code compliant. It is **POLYPROPYLENE**. There are no valid ES reports because it does not meet the flame spread requirements.

Table R703.3(1) fn k, ASTM D 7254

Exterior Wall Envelope

Inspections – R109

Final Inspection

Code changes from 2018 to 2021

2018 IRC	2021 IRC	CODE CHANGE
TABLE R702.3.1	TABLE R702.3.1	RR223.10
TABLE R702.7.1	TABLE R702.7.1	RR223.10
TABLE R702.7.1.1	TABLE R702.7.1.1	RR223.10
TABLE R702.7.1.2	TABLE R702.7.1.2	RR223.10
TABLE R702.7.1.3	TABLE R702.7.1.3	RR223.10
TABLE R702.7.1.4	TABLE R702.7.1.4	RR223.10
TABLE R702.7.1.5	TABLE R702.7.1.5	RR223.10
TABLE R702.7.1.6	TABLE R702.7.1.6	RR223.10
TABLE R702.7.1.7	TABLE R702.7.1.7	RR223.10
TABLE R702.7.1.8	TABLE R702.7.1.8	RR223.10
TABLE R702.7.1.9	TABLE R702.7.1.9	RR223.10
TABLE R702.7.1.10	TABLE R702.7.1.10	RR223.10
TABLE R702.7.1.11	TABLE R702.7.1.11	RR223.10
TABLE R702.7.1.12	TABLE R702.7.1.12	RR223.10
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TABLE R702.7.1.99	TABLE R702.7.1.99	RR223.10
TABLE R702.7.1.100	TABLE R702.7.1.100	RR223.10

First, a Clarification ...

- ✓ The exterior cladding material, such as the siding, exterior plaster (stucco), stone, brick, and adhered veneer, are not designed to serve as the exterior water-resistive barrier material.
- ✓ The primary exterior water-resistive barrier material is the approved felt, sheathing paper or exterior foam sheathing behind the exterior cladding material.

IRC Section R703

Exterior Finish 703

R703.2 Water-resistive barrier.
Exception:
In detached accessory buildings
Except/Depends.

R703.2, R703.7.3 - Water-Resistive Barriers

- WRB material options include:
 - No. 15 felt complying with ASTM D226, Type 1
 - ASTM E2556, Type I or II
 - ASTM E331
 - Other approved materials
- WRB requirements for dry climates versus wet climates are defined for stucco.

ASTM E2556/E2556M-10(2016) - Standard Specification for Vapor Permeable Flexible Sheet Water-Resistive Barriers Intended for Mechanical Attachment

Scope

- This specification is limited to vapor permeable flexible sheet materials which are intended to be mechanically attached and are generally installed behind the cladding system in exterior walls.
- This specification is limited to the evaluation of materials and does not address installed performance. Although the fastening practices (type of fastener, fastening schedule, etc.) may affect the installed function of these materials, they are not included in this specification.
- This specification does not address integration of the water-resistive barrier with other wall elements. The topic is addressed in more detail in Practice E2112 and Guide E2266.

ASTM E2556/E2556M-10(2016) - Standard Specification for Vapor Permeable Flexible Sheet Water-Resistive Barriers Intended for Mechanical Attachment

Scope

- The values stated in either SI units or inch-pound units are to be regarded separately as standard. The values stated in each system may not be exact equivalents; therefore, each system shall be used independently of the other. Combining values from the two systems may result in non-conformance with the standard.
- This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.

Exterior Plaster R703.7

Vapor Barrier

- The word's today are vapor barrier (more accurately called a vapor retarder) and its cousins, air barrier and moisture barrier. These words can be confusing because the materials that perform these functions may appear similar and because some materials can perform multiple functions.
- A vapor retarder reduces the flow of water vapor contained in the air. A vapor retarder is required when warm, moisture-laden air may travel by convection into a cooler area such as the attic or a wall cavity. There, the water vapor may condense into liquid water and cause damage. Polyethylene sheeting is a common form of a Class I vapor retarder. Asphalt-saturated Kraft paper found on fiberglass batt insulation is a common form of a Class II vapor retarder. Latex and enamel paints are common forms of a Class III vapor retarder.

Exterior Wall Water -Resistive Barrier

- The code requires the installation of one layer of No. 15 felt paper complying with ASTM D 226 for Type I felt.
- (This information should also be verified during the permit process)

R703.1 General, R703.2 Water-resistive barrier

Your local resource for stucco information

SMA
STUCCO MANUFACTURERS ASSOCIATION

<https://stuccomfgassoc.com>

TLPCA
TERRAZZO LATH & PLASTER ASSOCIATION

<http://www.tlpcpa.org>

www.mnlath-plaster.com

www.mnplaster.com

Pre-Certification / Pre-Permit

INSTALLATION CARD
Western Home Center Plaster System
Surrenco Business Company

Job Address: _____
ICCE Evaluation Service LLC
Evaluation Report ESR-1007
Date of Job Completion: _____

Plastering Contractor:
Name: _____
Address: _____
Telephone No.: _____
Approved contractor number as issued by coating manufacturer: _____

This is to verify that the exterior coating system on the building exterior at the above address has been installed in accordance with the evaluation report specified above and the manufacturer's instructions.

Signature of Installer (minimum of 20 working minutes) _____ Date _____

This installation card must be presented to the building inspector at the completion of work and before final inspection.

R703.9 Exterior insulation and finish system (EIFS)/EIFS with drainage

Basic Stucco Components

- ✓ Substrate (if used)
- ✓ Weather-Resistive or water barrier
 - ◆ Over sheathed applications
- ✓ Metal Lath or reinforcement
- ✓ Stucco
 - ◆ Thickness varies by application
- ✓ Primer
- ✓ Finish Coat

International Residential Code

- ✓ Defined in Chapter 7 of the IRC
- ✓ Weather barriers are defined in Section R703.2
 - ◆ ASTM D-226 asphalt felt, weighing not less than 14 lbs per 100 sq. ft.
 - ◆ Not required under paperbacked stucco lath
- ✓ Section R703.7 defines Exterior Plaster
 - ◆ Basically references ASTM E2556, Type I & II, ASTM C926, ASTM C1063 and Code

R703.6.2 Plaster

Plaster shall be not less than three coats where applied over metal lath or wire lath and shall be not less than two coats where applied over masonry, concrete, pressure-preservative-treated wood or decay-resistant wood as specified in Section R317.1 or gypsum backing. If the plaster surface is completely covered by veneer or other facing material or is completely concealed, plaster application need be **only two coats**, provided the total thickness is as set forth in Table R702.1(1).

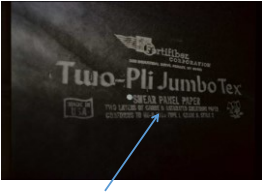
On wood-frame construction with an on-grade floor slab system, exterior plaster shall be applied to cover, but not extend below, lath, paper and screed.

Table R702.1(1) – Thickness of Plaster

PLASTER BASE	FINISHED THICKNESS OF PLASTER FROM FACE OF LATH, MASONRY, CONCRETE (inches)	
	Gypsum plaster	Portland cement mortar
Expanded metal lath	5/8" minimum ^a	1 1/2" maximum ^a
Wire lath	5/8" minimum ^a	3/4" minimum (interior) ^b 1 1/2" maximum (exterior) ^b
Gypsum lath ^a	1/2" minimum	3/4" minimum (interior) ^b
Masonry walls ^c	1/2" minimum	1/2" minimum
Monolithic concrete walls ^{c,d}	5/8" maximum	7/8" maximum
Monolithic concrete ceilings ^{c,d}	3/8" maximum ^a	1/2" maximum
Gypsum veneer base ^e	1 1/8" minimum	3/4" minimum (interior) ^b
Gypsum sheathing ^a	—	3/4" minimum (interior) ^b 7/8" minimum (exterior) ^b

Exterior Plaster (Stucco)- R703

When applied over wood-base sheathing, the weather-resistant barrier shall include a vapor permeable barrier equivalent to two layers of grade D paper.



R703.7.3 Water-resistant barriers

Grade Classifications of Building Paper

If you look in the Uniform Building Code under section 2506.4 it states that "Weather-resistant barriers shall be installed as required in Section 1402.1 and when applied over wood based sheathing shall include two layers of Grade D paper." So what does this mean?

There are four types of Building Papers available: "Type I" is intended for use in waterproofing. "Type II" is a concrete curing paper. "Type III" is used as a covering over thermal insulation for cold piping. "Type IV" is used in taping insulation joints in built-up roofs. Type I papers cannot crack when bent over a 1/16" mandrel at 32 degrees F.

The Grade classifications are based on the ability of the paper to resist water and the ability of the paper to pass water vapor (water in its gaseous state). "Grade A" is water-resistant and has high resistance to the passage of water vapor. "Grade B" is water resistant and moderately resistant to water vapor. "Grade C" is a water-resistant paper. "Grade D" is a paper that is water-resistant and will allow the passage of water vapor.

Grade "D" papers are also rated by time limitations. When you see a rating of 10 minutes, 30 minutes and 60 minutes, this simply means that this is the time it takes for the building paper to "wick" water. At a minimum the code requires a Type I, Grade "D", 10 minute Building Paper.

The paper you are using should be labeled and identified as a Type I, Grade "D" Building Paper. If it isn't, your supplier should be able to provide you with supportive documentation.

Exterior Plaster R703.7.3


KRAFT WATERPROOF BUILDING PAPER
 Grade A, high water-vapor resistant
 Grade B, moderate water-vapor resistant
 Grade C, water resistant
 Grade D, water-vapor permeable

Grade A paper is 144 times more water-resistant than grade D.

Grade D paper is the only grade that has a minimum requirement for water-vapor transmission.

Water-Resistive Barrier

- ✓ The one layer of Type I, No. 15 felt
- ✓ lapped 2 inches horizontally, and
- ✓ paper is to be installed continuous,
- ✓ 6 inches vertically.



R703.2 Water-resistant barrier

Water-Resistive Barrier

- ✓ ... Lapped 2 inches horizontally, and 6 inches vertically. What if it is applied vertically?

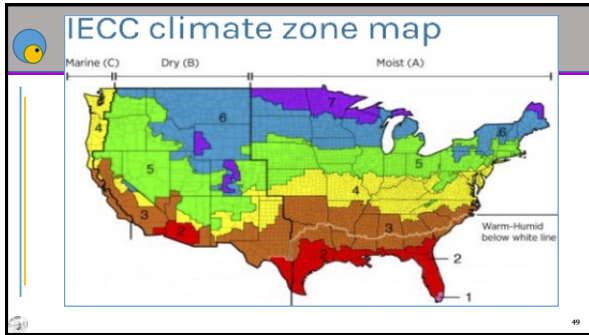


R703.2 Water-resistant barrier

Water-Resistive Barrier

- ✓ Type I, No. 15 felt paper complying with [ASTM D 226](#) is based on Federal Standard UUB 790a, and comes in 4 grades, that being A, B, C, and D.
- ✓ Grade A is the most water-resistant followed by grades B, C and D, with grade D the least water-resistant.
- ✓ Grade D is the only grade that is vapor permeable.

IRC Section R703



R703.7.3 - Water-Resistive Barriers

Water-resistive barriers shall be installed as required in [Section R703.2](#) and, where applied over wood-based sheathing, shall comply with [Section R703.7.3.1](#) or [R703.7.3.2](#).

R703.7.3.1 Dry climates.
In Dry (B) climate zones indicated in [Figure N1101.7](#), water-resistive barriers shall comply with one of the following:

1. The water-resistive barrier shall be two layers of 10-minute Grade D paper or have a water resistance equal to or greater than two layers of a water-resistive barrier complying with ASTM E2556, Type I. The individual layers shall be installed independently such that each layer provides a separate continuous plane. Flashing installed in accordance with [Section R703.4](#) and intended to drain to the water-resistive barrier shall be directed between the layers.
2. The water-resistive barrier shall be 60-minute Grade D paper or have a water resistance equal to or greater than one layer of a water-resistive barrier complying with ASTM E2556, Type II. The water-resistive barrier shall be separated from the stucco by a layer of foam plastic insulating sheathing or other non-water-absorbing layer, or a designed drainage space.

Code Change No: RB242-19

Lath R703.7.1

Lath and lath attachments shall be of corrosion-resistant materials. Expanded metal, welded wire, or woven wire lath shall be attached to wood framing members or furring. Where the exterior plaster is serving as wall bracing in accordance with [Table R602.10.4](#), the lath shall be attached directly to framing. The lath shall be attached with 1 1/2" long, 11-ga. nails having a 7/16" head, or 7/16" long, 16-ga. staples, spaced not more than 7" o.c. along framing members or furring and not more than 24" o.c. between framing members or furring, or as otherwise approved. Additional fastening between wood framing members shall not be prohibited.

Water-Resistive Barrier

- ✓ Brick veneer requires:
- ✓ One layer of No. 15 asphalt felt,
- ✓ Free from holes and breaks,
- ✓ Complying with ASTM D226 for Type I felt or
- ✓ Other approved water-resistive barrier

Figure R703.8 fn b, R703.2 and R703.8.4

Water-resistive Barrier -

- ✓ Water-resistive barriers other than the traditional No. 15 asphalt felt, must comply with the manufacturer's installation instructions.
- ✓ The exemption for detached accessory buildings was deleted.
- ✓ Now all accessory buildings must have a water-resistive barrier under the exterior wall covering.

R703.2


Water-Resistive Barrier

- ✓ Exterior plaster (aka stucco) needs two layers of (vapor-permeable barrier)-Type I, Grade D, No. 15 felt, or one layer plus an approved drainage plane system.

R703.7.3 Water-resistive barriers

Water-Resistive Barrier


- Adhered veneer needs two layers of (vapor-permeable barrier)-Type I, Grade D, No. 15 felt, or one layer plus an approved drainage plane system.
- 4" above the earth and 2" above paved areas



R703.8, R703.2, 703.12

Attaching Through Foam


- Cladding attachment over foam sheathing shall comply [Section 703.3](#) - [Table R703.3\(1\)](#) with the additional requirements and limitations of [Sections R703.15](#) through [R703.17](#)



R703.3, R703.17 Cladding attachment over foam sheathing to masonry or concrete wall construction

Alternative Materials


- What documentation can verify that a proposed product is equivalent to the Type I, No. 15 that is needed?



IRC Section R104

Alternative Materials

- For determining equivalency to the Type I paper, or the Type I, Grade D paper for exterior plaster, data should be submitted to the Building Official that shows that the proposed material is equivalent to that prescribed in the code.



IRC Section R104

What do you see????



99

Alternative Materials

- This data could be:
 - Manufacturer's specifications
 - Independent third-party testing
 - An Evaluation Service Report from the International Code Council Evaluation Service (www.icc-es.org)
 - Information from some other source
 - This data would need to be approved by the Building Official.


(continued)

IRC Section R104

Alternative Materials

- ✓ The ICC-Evaluation Service (ICC-ES) reports for Water-Resistive Barriers are based on (Acceptance Criteria) AC-308, which establishes criteria for recognition of water-resistive barriers based on the provisions contained in the I-Codes.

(air leakage, vapor transmission, surface-burning characteristics, Drainage capability, etc.)



IRC Section R104 64

Example of Alternative Material Process

- ✓ Example of ES report: ESR-2375 Dupont Tyvek.
- ✓ Although an ICC-ES report is not required, it may assist in determining compliance with the code and standard.


Report number	Manufacturer	Product	Codes
ESR-2375	Dupont de Nemours & Co. (NYSE:DD) Tyvek® Building Wrap, Model # 2300	Dupont™ Tyvek® HomeWrap™, Model # 2300, Dupont™ Tyvek® Building Wrap, Model # 2300, Dupont™ Tyvek® Building Wrap, Model # 2300, Dupont™ Tyvek® Building Wrap, Model # 2300, Dupont™ Tyvek® Building Wrap, Model # 2300	ICC-ES ESR-2375

Report number	Manufacturer	Product	Codes
ESR-2375	Dupont de Nemours & Co. (NYSE:DD) Tyvek® Building Wrap, Model # 2300	Dupont™ Tyvek® HomeWrap™, Model # 2300, Dupont™ Tyvek® Building Wrap, Model # 2300, Dupont™ Tyvek® Building Wrap, Model # 2300, Dupont™ Tyvek® Building Wrap, Model # 2300, Dupont™ Tyvek® Building Wrap, Model # 2300	ICC-ES ESR-2375

IRC Section R703 & R703.4 64

Water-Resistive Barrier Drainage Plane


- ✓ Considerations:
- ✓ No "standard" in code.
- ✓ Needs approval by the Building Official.
- ✓ Exterior plaster exception for single
- ✓ Layer of Grade D.
- ✓ Other?



IRC Section R104 63

Exterior Barrier Components


- ✓ Insulated sheathing, siding, flashing...



IRC Section R703 & R703.4 64

Exterior Barrier Components

- ✓ Penetrations, such as this dryer vent...



IRC Section R703 & R703.4 65

Exterior Barrier Components

- ✓ Flashing at exterior projections such as brick veneer.



IRC Section R703 & R703.4 66

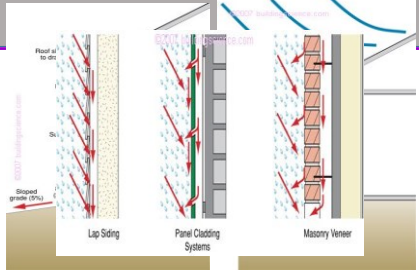
Exterior Barrier Components

✓ Window flashing/sealing method.




ASTM E 2112

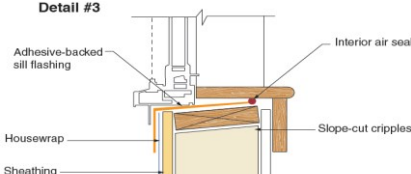
Exterior Barrier Components



Building Science.com

R703.4 item 1, Flashing.

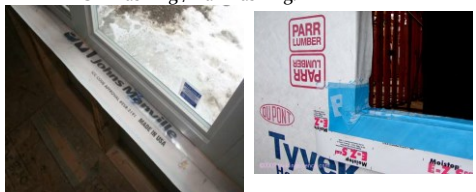
Detail #3




Exterior window and door openings. Pan flashing shall be sealed or sloped in such a manner as to direct water to the surface of the exterior wall finish or to the water-resistant barrier for subsequent drainage. Openings using pan flashing shall also incorporate flashing or protection at the head and sides.

Exterior Barrier Components

✓ Sill flashing / Pan flashing.





PAN FLASHING. Corrosion-resistant flashing at the base of an opening that is integrated into the building exterior wall to direct water to the exterior and is premanufactured, fabricated, formed or applied at the job site.



Exterior Barrier Components


✓ Stay-in-Place Form (Insulated Concrete Form (ICF) Foundation Walls

IRC Section R703 & R703.4

Exterior Barrier Components

- ✓ Insulated Concrete Form (ICF) Foundation Wall Deck Attachment.




IRC Section R703 & R703.4

73

Roofing

- ✓ The following slides will address some of the components that are typically addressed related to roofing weather barrier components, such as underlayment, ice barriers, drip edge, penetrations and flashing.



IRC Section R905


74

Drip Edge for Roofing

Although not required in earlier editions of the IRC, a drip edge is now required at eaves and gables of all shingled roofs.

- Extend at least ¼ inch below sheathing
- Extend up the roof deck at least 2 inches
- Underlayment to be placed over drip edge at eaves and under the drip edge at gables
- Shingles are permitted to be flush with drip edge

MRC - R905.2.8.5 Drip edge. - Deleted.



R905.2.8.5 Drip edge

75

Gutters and Down spouts

- ✓ In areas where expansive or collapsible soils are known to exist...



R801 Roof drainage

76

Flashing

- ✓ Valley flashing and/or type of valley flashing method.

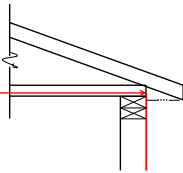



IRC Section R905

77

703.2 Water-Resistive Barrier

The felt or other approved material shall be continuous to the top of walls and terminated at penetrations and building Appendages...





R 703.2

78

Flashing - R703.8 Item 6


✓At wall and roof intersections.



79


Kick-out Flashing

✓Step flashing and kick-out flashing



IRC Section R905

80




R905.2.8.3 Sidewall flashing

81

703.2 Water-Resistive Barrier


Flashing shall be installed in shingle-fashion and must extend to the surface of the exterior wall finish or to the water-resistive barrier.



82

Special Flashing For Solar Systems

✓Flashing method for bracket supports and electrical junction



IRC Section R905

83

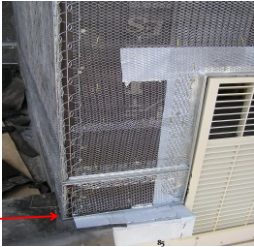
Application/ Application



84

Weep Screens - R703

The weather-resistant barrier shall lap the attachment flange and the exterior lath shall cover and terminate on the attachment flange of the weep screen.



R703.7.2.1 Weep screens

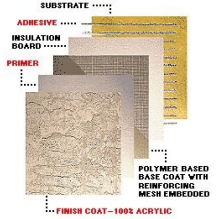
Base - Application




EIFS


Exterior Insulation Finish Systems (EIFS)

- Synthetic stucco cladding systems typically consisting of five layers:
 - Adhesive
 - Insulation board
 - Base Coat
 - Embedded fiberglass reinforcing mesh
 - Finish coat in the desired color



Flashing

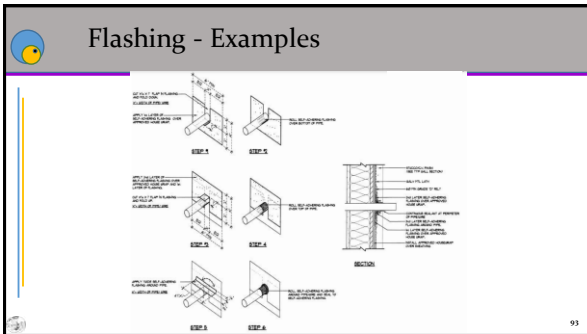
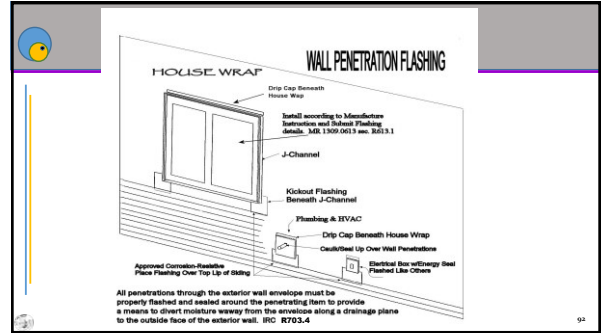
Approved corrosion-resistive material provided in such a manner as to deflect and resist entry of water into the construction assembly.



R703.4 Flashing.



R703 & 703.4



The Rules of Building Performance

- ✓ Moisture moves from more to less
- ✓ Moisture move from warm to cold
- ✓ Heat flows from warm to cold
- ✓ CFM (air) out equals CFM (air) in
- ✓ Drain the rain

Control Liquid Flow through the Building Envelope

- ✓ Flashing systems
- ✓ Weather barriers
- ✓ Rain screens
- ✓ Foundation drainage system
- ✓ Capillary breaks or non-porous ma

Air Pressure in Buildings

- ✓ Natural forces
 - ◆ Stack Effect
 - ⊗ Temperature difference drives air flow
 - ⊗ Pressure planes establish directional flows (in/out)

Exterior Covering

Weather-resistive barrier.

“The exterior wall envelope shall be designed and constructed in a manner that prevents the accumulation of water within the wall assembly by providing a water-resistant barrier behind the exterior veneer... and a means of draining water that enter the assembly to the exterior.”

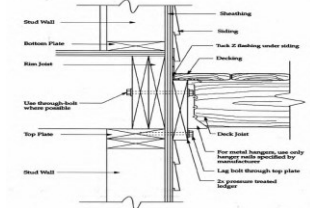


IRC section R703.1

97

Rim Joist/Band Joist

Deck attachment



98

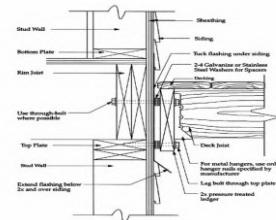
What Flashing approved for use with ACQ treated lumber?



99

Rim Joist/Band Joist

Flashed deck attachment



100

R703 Exterior Coverings

Weather- resistive barrier.

The exterior wall envelope shall be designed and constructed in a manner that prevents the accumulation of water within the wall assembly by providing a water-resistant barrier behind the exterior veneer... and a means of draining water that enter the assembly to the exterior.



101

Exterior Covering

A minimum of one layer of No. 15 asphalt felt...or other weather-resistive material shall be applied over sheathing of all exterior walls... including gables at unconditioned attics.



102

Exterior Covering

Table R703.3(1)
Siding Minimum Attachment and Minimum Thickness

SIDING MATERIAL	MINIMUM THICKNESS (inches)	JOINT TREATMENT	TYPE OF SUPPORTS FOR THE SIDING MATERIAL AND FASTENERS						
			Wood or metal structural panel sheathing into stud	Fiberboard sheathing into stud	Oppose sheathing into stud	Foam plastic sheathing into stud	Open joists	Over 60 studs	Number or spacing of fasteners
Approved metal cladding, aluminum, magnesium or steel, over Section R703.3.2	2	Section R703.3.2	Section R703.3.2						
Approved masonry composite, ceramic or impregnated stone Section R703.3.2	---	Section R703.3.2	Section R703.3.2						
Fiber-reinforced gypsum	1/2	Section R703.3.2.2	10 gpm (2" x 8-11 1/2")	All approved (2" x 8-11 1/2")	All approved (2" x 8-11 1/2")	All approved (2" x 8-11 1/2")	All approved (2" x 8-11 1/2")	All approved (2" x 8-11 1/2")	12" gpm (12" x 12" min. min.)
			12 gpm (2" x 8-11 1/2")	All approved (2" x 8-11 1/2")	All approved (2" x 8-11 1/2")	All approved (2" x 8-11 1/2")	All approved (2" x 8-11 1/2")	All approved (2" x 8-11 1/2")	12" gpm (12" x 12" min. min.)
Horizontal panel siding over Section R703.3.2	3/8	---	0.125" nail	0.125" nail	0.125" nail	0.125" nail	0.125" nail	0.125" nail	8" gpm (8" x 12" min. min.)
			0.200" nail	0.200" nail	0.200" nail	0.200" nail	0.200" nail	0.200" nail	8" gpm (8" x 12" min. min.)
Horizontal vinyl siding over Section R703.3.2	3/8	None *	0.080" nail	0.080" nail	0.080" nail	0.080" nail	0.080" nail	0.080" nail	Same as wall sheathing, 2 per fastener
			0.125" nail	0.125" nail	0.125" nail	0.125" nail	0.125" nail	0.125" nail	Same as wall sheathing, 2 per fastener
Horizontal aluminum*	0.018	L-Strap	Strapping nail	Strapping nail	Strapping nail	Strapping nail	Strapping nail	Strapping nail	Not allowed
			2" x 4-10 1/2"	2" x 4-10 1/2"	2" x 4-10 1/2"	2" x 4-10 1/2"	2" x 4-10 1/2"	2" x 4-10 1/2"	Not allowed
Horizontal masonry*	0.018	L-Strap	Strapping nail	Strapping nail	Strapping nail	Strapping nail	Strapping nail	Strapping nail	Same as wall sheathing
			2" x 4-10 1/2"	2" x 4-10 1/2"	2" x 4-10 1/2"	2" x 4-10 1/2"	2" x 4-10 1/2"	2" x 4-10 1/2"	Same as wall sheathing

Exterior Covering

Water/Weather-resistive barrier.

- ✓ "... or other approved water/weather-resistive material shall be applied over sheathing or studs of all exterior walls... top to bottom"
- ✓ means of draining to the exterior

R703.2 & R703.1

Exterior Covering

Weather-resistive barrier

DuPont Tyvek DrainWrap vs. GreenGuard RainDrop

TECH TALK

ICC Evaluation Service, Inc. **NER-699** (Issued December 1, 2022)

ICC Evaluation Office • 1300 Valley Road, Suite 1000, Cary, NC 27513 • 919-882-9400
Report Office • 10100 Research Ave., Suite A, Wilmington, Delaware 19815 • 302-889-8880

ICC-ES.org

LISTED: Owens Corning Fiberglas Company, One Chesapeake Parkway, Toledo, Ohio 43624

ICC-ES.org

Vinyl Siding Institute

www.vinylsiding.org

2018 Vinyl Siding Installation Manual

Go from good to great

Table R703.4 Footnote 'I' requires that vinyl siding must comply with ASTM D 3679.

ICC-ES ESR-1111—Vinyl Siding

SIDING MATERIAL	MINIMUM THICKNESS (inches)	JOINT TREATMENT	TYPE OF SUPPORTS FOR THE SIDING MATERIAL AND FASTENERS						
			Wood or metal structural panel sheathing into stud	Fiberboard sheathing into stud	Oppose sheathing into stud	Foam plastic sheathing into stud	Open joists	Over 60 studs	Number or spacing of fasteners
Steel	3/8	L-Strap	1/4" x 1/4" nails	1/4" x 1/4" nails	1/4" x 1/4" nails	1/4" x 1/4" nails	1/4" x 1/4" nails	1/4" x 1/4" nails	Not allowed
Vinyl siding over Section R703.3.2	0.018	L-Strap	0.037" nail	0.037" nail	0.037" nail	0.037" nail	0.037" nail	0.037" nail	18 inches on center or other as specified by manufacturer's instructions in ICC-ES report

R703.4(1) Vinyl siding.

Vinyl siding shall be certified and labeled as conforming to the requirements of ASTM D3679 by an approved quality control agency.

Exterior Covering

Weather-resistive barrier must be installed per manufacturer's requirements.

ICC Evaluation Service, Inc. **Sample** (Issued December 1, 2022)

ICC-ES.org

ICC Evaluation Office • 1300 Valley Road, Suite 1000, Cary, NC 27513 • 919-882-9400
Report Office • 10100 Research Ave., Suite A, Wilmington, Delaware 19815 • 302-889-8880

ICC-ES.org

LISTED: Owens Corning Fiberglas Company, One Chesapeake Parkway, Toledo, Ohio 43624

Exterior Covering

4.0 INSTALLATION

GreenGuard® Housewraps are installed on the exterior side of exterior walls over exterior sheathing or insulation. The printed side is installed facing to the outside.

GreenGuard® Housewraps are installed after wall framing is completed, and before or after windows and doors are installed. The roll is placed 24 inches (610 mm) from the corner and fastened using plastic cap nails spaced a maximum of 16 inches (406 mm) or staples with minimum 1 inch (25 mm) crown spaced 12 inches (305 mm) on center and then unrolled around the building and fastened with nails or staples spaced as noted above. Fasteners shall penetrate at least 1/2 inch (13 mm) into nail base. A minimum of 6 inches (152 mm) overlap for the sheet in the horizontal and vertical dimension is recommended. The higher piece of housewrap on the wall shall lap over the lower piece. Horizontal and vertical joints are sealed with tape (Pactiv Contractor Tape or equivalent).

When applying over foam insulation boards, the fabric is fastened with nails or staples long enough to penetrate the insulation and grip framing studs.

Weather-resistant barrier must be installed per manufacturer's requirements.

R703 - mentioned 75 times

Additional Fasteners Required

Big Picture

Installation must comply with manufacturer's requirements

1/4" space at top of wall

6"-12"

Figure 28.

Additional Fasteners Required

Flashing detail for windows-VSI

Windows, Doors, and Roof Lines

Window Flashing

The following practices should be followed when installing window flashing:

- Apply the flashing on the exterior side of the window frame (Fig. 29).
- Follow the application with manufacturer's instructions. Make sure to overlap the bottom flashing (Fig. 29).
- Properly apply the flashing at the head of the window.

The flashing should extend over the full height of the window to prevent water infiltration (Fig. 29). The flashing should be fastened to the wall studs with the nail through the head of the window to the wall studs. Use the flashing as a guide for installing the window to the wall opening and as a reference for the window and door.

Door

Jambinals to used around windows and doors to provide the flashing. Follow the manufacturer's instructions when applying them.

- Do not install the jambinal on the side of the window.
- Do not install the jambinal on the bottom of the window.
- Fast the bottom end of the jambinal to the wall studs at the bottom of the window. To use the flashing jambinal to prevent water from entering under the sill.

NOTE: The flashing is long enough to provide overlap over the top edge of the jambinal and over the top edge of the jambinal.

Figure 29.

Figure 30.

Exterior Covering


Weather-resistive barrier.

“Flashing at exterior window and door openings shall extend to the surface the exterior wall finish or to the water-resistive barrier for subsequent drainage.”



R703.4 Flashing.

Great Intent BUT????



Exterior Covering

Vinyl siding must be installed per the manufacturers installation instructions.




Permit Required????

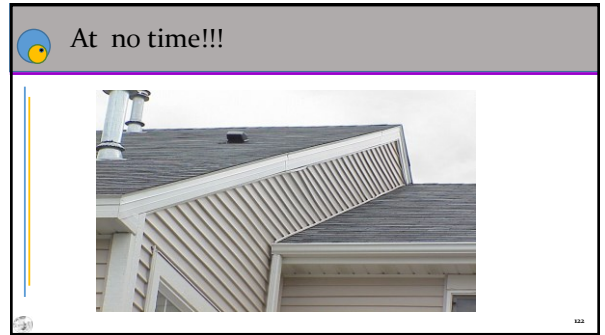


Fasteners Shall Penetrate Framing



Staples permitted but must allow for movement of siding





Exterior Covering

Weather-resistive barrier.

Foam siding backer.

What about the foam backer as a weather barrier?

Probably Not.
Most foam backers are perforated and do not comply with ICC Acceptance Criteria AC38 ASTM D 7793

ICC EVALUATION SERVICE, INC.
Source: AIAA-0000000000

ES

ACCEPTANCE CRITERIA FOR WATER-RESISTIVE BARRIERS

AC38

Approved June 2004
 Effective July 1, 2004

ASTM D 3679

Designation: D 3679 - 96a

Please contact ASTM for the latest version.
 An American National Standard

Standard Specification for Rigid Poly(Vinyl Chloride) (PVC) Siding¹

This standard is issued under the fast designation D 3679. An asterisk immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. It indicates the year of last reapproval. A superscript epsilon (ϵ) indicates an editorial change since the last issue or reapproval.

- Scope**
 - 1.1 This specification establishes requirements and test methods for one material, dimensions, shape, thickness, impact strength, expansion, appearance, and windload resistance of standard single-wall siding manufactured from rigid (unplasticized) PVC compound. Methods of indicating compliance with this specification are also provided.
 - 1.2 Rigid PVC (unplasticized) plastic may be used in this product in accordance with the requirements in Section 4.
 - 1.3 Nonmandatory color-hold guidelines are provided in Appendix X1 for manufacturers' product development and quality performance use only.
 - 1.4 Rigid (unplasticized) PVC solids is covered in Specification D 6677.
 - 1.5 Siding produced to this specification shall be installed in accordance with Practice D 4795. References shall also be made to the manufacturer's installation instructions for the specific product to be installed.
- Referenced Documents**
 - 2.1 *ASTM Standards:*
 - D 236 Test Method for Impact Resistance of Plastics and Electrical Insulating Materials²
 - D 174 Test Method for Thickness of Solid Electrical Insulation³
 - D 527 Test Method for Specific Gravity⁴
 - D 618 Practice for Conditioning Plastics and Electrical Insulating Materials for Testing⁵
 - D 635 Test Method for Rate of Burning and/or Excess and Time of Burning of Self-Supporting Plastics in a Horizontal Position⁶
 - D 696 Test Method for Coefficient of Linear Expansion of Plastics⁷
 - D 1042 Test Method for Linear Dimensional Changes of Plastics⁸
 - D 1453 Practice for Outdoor Weathering of Plastics⁹
 - T 1400 Terminology for Abbreviated Terms Relating to

Subpart 7. Product Marking

D 3679

restoration of finished siding in accordance with Test Method D 3206.

7. Product Marking

7.1 In order that purchasers may identify siding conforming to all requirements of this specification, producers and distributors shall include a statement of compliance in conjunction with their name and address on product labels, invoices, sales literature, and the like. The following statement is suggested when sufficient space is available:
 This PVC siding conforms to all the requirements established in ASTM Specification D 3679, developed cooperatively with the industry and published by ASTM.
 Full responsibility for the conformance of this product to the specifications is assumed by (name and address of producer or distributor).

7.2 The following abbreviated statement is suggested when available space on labels is insufficient for the full statement: Conforms to ASTM Specification D 3679 (name and address of producer or distributor).

8. Packing, Packaging, and Package Marking

8.1 The siding shall be packed in such a manner as to provide reasonable protection against damage in ordinary handling, transportation, and storage.

8.2 Provisions of Practice D 3892 shall apply to this specification.

9. Keywords

9.1 plastic building products; plastic weatherability, recycled plastic; rigid PVC siding, specification; weatherability color-hold guidelines

Approved product label

SAMPLE

2/2008/04

Restoration Classic

T3"

Cypress

3613242 | **Smooth**

(HCST3/842)

7 36463 00442 9

2 SQ 22 PC

Wolverine

Approved product. Incomplete label

SAMPLE

Hand-Split Shake
Bardeau de fente

Natural Cedar
Cèdre naturel

NALITE
International

LABNCA 3333 N.W. 108th Street, Miami, Florida 33188-0871 1PNCXFH

127

ES Report is not current

CONFORMS TO ASTM D3679
BOCA, ES INC. REPORT #97-33
SBCCI PST & ESI REPORT #9628A
TEXAS DEPT. OF INSURANCE #EC-29

SAMPLE

128

Incomplete labeling.
Is product approved? **NO**

SAMPLE

FINISH WORKS ACCENT
PANEL

Shake

18 pcs. 50" long -75.0 Linear Feet

Canyon Blue

326949

PC **MADE IN THE USA** DATE: 06/10/03

129

