

# TECH SOLUTIONS 211.0 STYROFOAM SIS™ BRAND STRUCTURAL INSULATED SHEATHING AS A WATER-RESISTIVE BARRIER



## WATER-RESISTIVE BARRIER REQUIRED BY BUILDING CODES

More and more, code requirements call for builders to install a water-resistive barrier (WRB) for all exterior residential wall assemblies. For example, Section R703.1 of the International Residential Code specifies using a WRB:

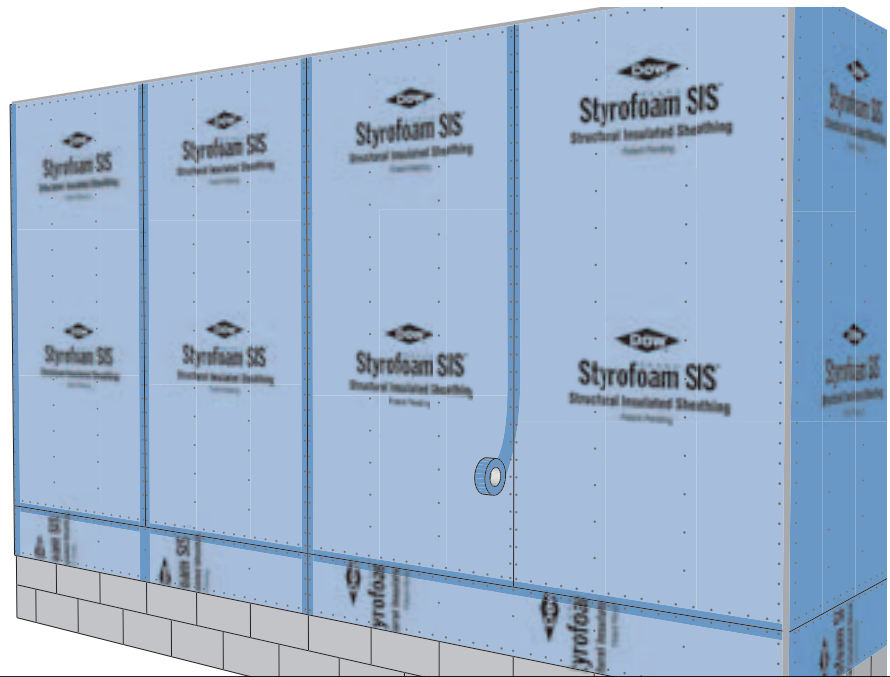
*The exterior wall envelope shall be designed and constructed ... by providing a water-resistant barrier behind the exterior veneer ...*

To meet code, a WRB product is often installed over the structural sheathing, which requires an extra installation trip around the house. Of course, an extra trip means extra installation time, labor, complexity and cost. There is a better way.

## A BETTER WRB SOLUTION

Builders can achieve WRB requirements, structural lateral bracing and traverse loads, and continuous insulation with only one product and one less trip around the house. STYROFOAM SIS™ Brand Structural Insulated Sheathing does it all.

Figure 1: STYROFOAM SIS™ Brand Structural Insulated Sheathing installed as a WRB.



How? STYROFOAM SIS™ Brand Structural Insulated Sheathing is a multilayered panel consisting of tough laminated fibrous board for bracing and closed-cell polyisocyanurate foam insulation protected on both sides with durable facers. STYROFOAM SIS™ Brand Structural Insulated Sheathing completes a “trifecta” of functionality by providing structural bracing, continuous insulation and a water-resistive barrier.

(See Figure 1 for STYROFOAM SIS™ Brand Structural Insulated Sheathing installed as a WRB in a residential wall assembly.)

# STYROFOAM SIS™ BRAND STRUCTURAL INSULATED SHEATHING AS A WATER-RESISTIVE BARRIER

**TABLE 1: STRUCTURAL INSULATED SHEATHING – RIGOROUSLY TESTED WRB**

Water-Resistive Barrier Type		No. 15 Asphalt Paper	Felt or Paper-based Barrier	Polymeric-based Barrier (e.g., house-wraps)	Laminated Fibrous Board (STYROFOAM SIS™ Brand Structural Insulated Sheathing)
ICC-ES Acceptance Criteria		None (grandfathered in code)	AC38	AC38	AC382
Material Tests Without Weathering	Various Material Tests	X	X	X	X
Material Tests With Weathering	<u>Weathering UV</u> 10 hrs/day, 21 days @ ~137°F 25 cycles: 3 hrs @ 120°F 3 hrs @ water immersion (~75°F) 18 hrs @ 75°F Hydrostatic Head 5 hrs @ 550 mm (AATCC Method 127)			X	X
	<u>Freeze-Thaw</u> 10 cycles: 8 hrs @ 120°F 8 hrs @ water immersion (~75°F) 16 hrs @ -20°F				X
	<u>Water Resistance – Humidity (ASTM D2247)</u> 14 days @ 100°F, 100% RH				X
	<u>Transverse Load, Controlled Environmental Cycling, Racking, Water Penetration</u> Transverse Load (10 cycles) (ASTM 1233, Proc. A) 5 cycles: 24 hrs @ water spray 5 gal/ft²/hr 24 hrs @ 120°F radiant heat Rack to 0.5" or 0.125" (ASTM E72) Water Penetration: 15 min @ 5 gal/ft²/hr, 2.86 psf (ASTM E331)				X
Installed System Tests With Weathering	<u>Controlled Environmental Cycling and Rack to Failure</u> 24 hrs @ water spray 5 gal/ft²/hr 24 hrs @ 120°F radiant heat Rack to Failure (ASTM E72)				X

## STYROFOAM SIS™ BRAND STRUCTURAL INSULATED SHEATHING PERFORMANCE AS A WRB

How well does STYROFOAM SIS™ Brand Structural Insulated Sheathing perform as a WRB? As demonstrated in Table 1, STYROFOAM SIS™ Brand Structural Insulated Sheathing is one of the most rigorously tested water-resistive barriers. The ICC-ES\* AC382 WRB requirements are

severe because of the specified weathering, environmental and system testing. In fact, many water-resistive barrier products undergo testing on the material only and not with fasteners or joints to simulate actual field conditions on the job site. Further, some of those WRB products are not tested with exposure to ultra-violet light, weathering or other harsh environmental conditions.

STYROFOAM SIS™ Brand Structural Insulated Sheathing passes all AC382 tests and performs remarkably well in tough environments.

After viewing Table 1, consider this question: Which WRB product gives you the most confidence in protecting a new home from moisture? The answer is obvious. STYROFOAM SIS™ Brand Structural Insulated Sheathing is not only a proven WRB, but also

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\*ICC-ES is the International Code Council Evaluation Service. ICC-ES is a nonprofit corporation that does technical evaluations of building products, components, methods and materials. ICC-ES evaluation reports are intended mainly to aid agencies that enforce building regulations, by assisting them to determine code compliance. Evaluation reports are also used by architects, engineers, specifiers and others in the building industry who have an interest in making sure products and systems meet building code requirements. (www.icc-es.org)

## STYROFOAM SIS™ BRAND STRUCTURAL INSULATED SHEATHING AS A WATER-RESISTIVE BARRIER

presents a more robust installation because the primary water-resistive layer is factory installed. This is a distinct advantage over other flexible WRB products that must be installed at the job site, and can be potentially damaged from wind gusts. With the integral bonding of the facer material, STYROFOAM SIS™ Brand Structural Insulated Sheathing is very rigid and highly protected against wind damage.

### SEALING THE PANEL JOINTS

To ensure WRB requirements, STYROFOAM SIS™ Brand Structural Insulated Sheathing joints are simply taped with ultra tough 2-7/8" WEATHERMATE™ Construction Tape as shown in Figure 1 (see page 1).

WEATHERMATE™ Construction Tape has excellent adhesion and tensile strength, and can be installed at temperatures from 15°F to 120°F. For STYROFOAM SIS™ Brand Structural Insulated Sheathing, all of the AC382 tests employed WEATHERMATE™ Construction Tape over vertical or horizontal joints in the test method, providing assurance that the wall installation will be highly robust and long-lasting.

For builders who prefer housewrap as the WRB, an alternative to taping the STYROFOAM SIS™ Brand Structural Insulated Sheathing joints is to apply WEATHERMATE™ Plus Housewrap over the sheathing. Then, from a code standpoint, AC38 requirements would apply since housewrap serves as the WRB.

### WHAT DO THE EXPERTS SAY?

Commenting on STYROFOAM SIS™ Brand Structural Insulated Sheathing as an exciting new groundbreaking product, Building Scientist Joe Lstiburek, from Building Science Consulting, stated:

*STYROFOAM SIS™ Brand Structural Insulated Sheathing is an excellent option that provides wall bracing, weatherization and energy performance in a single product.*

Eric R. Smith, from David Weekley Homes, stated:

*STYROFOAM SIS™ Brand Structural Insulated Sheathing increases the moisture resistance of the sheathing system, eliminating the need for plywood or OSB products. I would highly recommend it (STYROFOAM SIS™ Brand Sheathing) to any builder.*



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## STYROFOAM SIS™ BRAND STRUCTURAL INSULATED SHEATHING AS A WATER-RESISTIVE BARRIER

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NOTICE: Changes to the International Residential Code require the installation of a water-resistive barrier (WRB) within most exterior wall assemblies in residential construction. The following Dow insulated sheathing products qualify as a WRB when installed according to the installation instructions developed for "installation of foam sheathing as a water-resistive barrier": STYROFOAM™ DURAMATE™ Plus, STYROFOAM™ Residential Sheathing, STYROFOAM™ Tongue and Groove, STYROFOAM SIS™, STYROFOAM™ Square Edge, STYROFOAM™ Residing Board, STYROFOAM™ High Performance Underlayment, THERMAX™ Sheathing, TUFF-R™ and Super TUFF-R™ and therefore do not require the use of a building paper or a housewrap as a WRB. When a WRB is not needed, these Dow foam sheathings may be installed according to standard installation instructions for foam sheathing from Dow. Be sure products and installation instructions meet code requirements for your particular location. Note: WEATHERMATE™ and WEATHERMATE™ Plus Housewraps have already qualified as water-resistive alternatives to the prescribed felt (see Evaluation Reports NER-593 and NER-640 for approved alternative).

CAUTION: This product is combustible and shall only be used as specified by the local building code with respect to flame spread classification and to the use of a suitable thermal barrier. For more information, consult MSDS and/or call Dow at 1-866-583-BLUE (2583). In an emergency, call 1-989-636-4400.

**WARNING: Rigid foam insulation does not constitute a working walkable surface or qualify as a fall protection product.**

Building and/or construction practices unrelated to building materials could greatly affect moisture and the potential for mold formation. No material supplier including Dow can give assurance that mold will not develop in any specific system.

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