QUICK GUIDE
Foam Plastic Applications for Better Building

CODE-COMPLIANT VINYL SIDING APPLICATIONS over Foam Plastic Insulating Sheathing (FPIS) Continuous Insulation (ci)

IMPORTANT! READ ALL INSTRUCTIONS BEFORE BEGINNING INSTALLATION

INTRODUCTION

Vinyl siding is a popular siding material and is commonly applied over foam plastic insulating sheathing (FPIS) continuous insulation (ci) used for building code and energy code compliant walls. Like other siding products, it must be specified and installed to resist design wind load pressures as required by code. Design wind load pressure ratings of standard vinyl siding products rely on ASTM D3679.[1] This standard uniquely incorporates wind pressure equalization effects that account for reduced wind load on the siding material. This load-reducing effect varies depending on construction of the wall assembly to which the vinyl siding is installed.

This Quick Guide outlines a step-by-step process to ensure vinyl siding is properly specified and installed when applied over FPIS ci for a durable and code-compliant installation.

STEP 1: VERIFY MATERIAL COMPLIANCE.

Ensure that the specified vinyl siding product complies with ASTM D3679 in accordance with 2024 IRC Section R703.11 and identify the product's design wind load pressure rating as required for any vinyl siding application (see Photo 1).

Photo courtesy of the Vinyl Siding Institute.

Photo 1. Example of typical vinyl siding product label with a design wind load pressure rating of 77.2 psf.

STEP 2: CONSIDER ADDITIONAL REQUIREMENTS FOR INSTALLATION OVER FPIS.

Determine if any additional specification and installation requirements are applicable for vinyl siding installed over FPIS in accordance with 2024 IRC Section R703.11.2, including the listed exceptions as noted in the table below. The following three installation conditions govern the design wind pressure rating and installation of the vinyl siding and the FPIS material:

CONDITION 1	CONDITION 2	CONDITION 3
2024 IRC Section R703.11.2, Exception 1	2024 IRC Section R703.11.2	2024 IRC Section R703.11.2, Exception 2
FPIS installed as "Over-sheathing" (see Figure 1)	**FPIS installed directly over Open Stud Cavities (see Figure 2)** **OPTION A:** FPIS material and siding fastened as an assembly to resist wind load **OPTION B:** FPIS material fastened to resist design wind load independent of siding	**Vinyl siding installed over FPIS in accordance with siding manufacturer's installation instructions**

[1] ASTM D3679 is referenced in Section R703.11 of the 2021 IRC and applies to standard "hollow-backed" vinyl siding. However, the guidance in this Quick Guide can be applied equivalently to insulated vinyl siding products complying with ASTM D7793 as addressed in 2021 IRC Section R703.13.

CONDITION 1:
FPIS INSTALLED AS "OVER-SHEATHING"

(2024 IRC Section R703.11.2, Exception 1)

As shown in Figure 1, this condition applies where the FPIS is "applied directly over wood structural panels, fiberboard, gypsum sheathing, or other approved backing capable of independently resisting the design wind pressure." In this condition, 2024 IRC Section R303.8 (or Section R316.8 in earlier editions) do not require that the FPIS be rated for wind pressure resistance. For the vinyl siding, simply install it over the FPIS in accordance with 2024 IRC Sections R703.3.3 (if used) and R703.11.1 and the siding manufacturer's installation instructions after verifying the following two items as required for any vinyl siding installation:

1. The length of the siding nail is sufficient to accommodate the FPIS thickness and maintain the minimum required fastener embedment in wood framing materials.
2. The design wind pressure rating of the siding (see Step 1) must meet or exceed the design wind pressure required by 2024 IRC Tables R301.2.1(1) and R301.2.1(2) based on the basic design wind speed mapped in Figure R301.2(2). For many applications within the scope of the IRC, a design wind load pressure rating of 30 psf or greater should prove to be code-compliant. Higher design pressure ratings will provide improved performance and are required in the more extreme wind exposures and regions of the U.S.

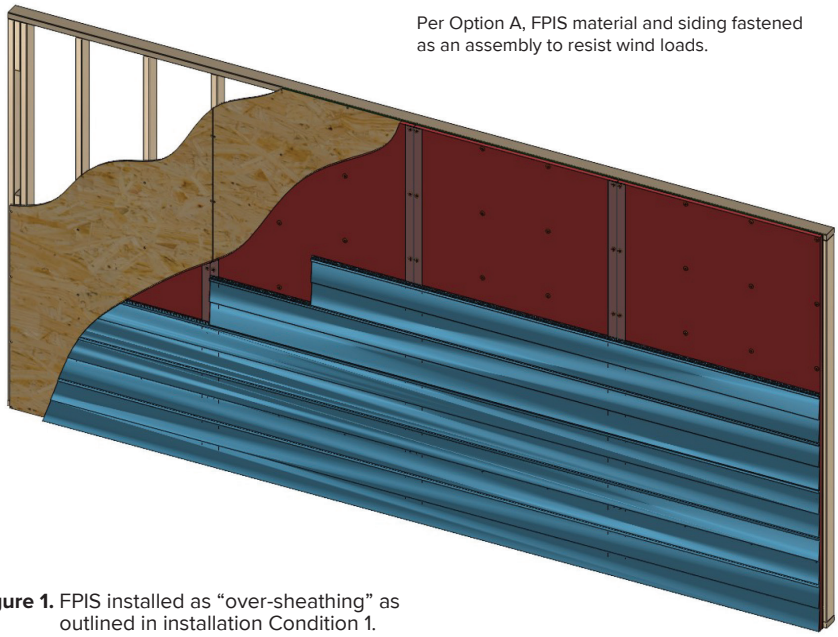

Figure 1. FPIS installed as "over-sheathing" as outlined in installation Condition 1.

CONDITION 2:
FPIS INSTALLED DIRECTLY OVER OPEN STUD CAVITIES

(2024 IRC Section R703.11.2)

For this condition, FPIS is installed directly to studs and over open stud cavities. No separate structural sheathing or solid backing is used in this assembly. There are two options related to how the FPIS layer is specified and fastened to the framing over open stud cavities as shown in Figures 2 and 3. In both options discussed below, the FPIS material itself must be rated for wind pressure resistance in accordance with 2024 IRC Section R303.8 (or Section R316.8 in earlier editions) and the ANSI/ABTG FS 100 Standard. Additionally, Option A also requires wind pressure resistance rating of the FPIS and vinyl siding as an assembly.

Option A: Vinyl siding and FPIS installed as an exterior wall covering assembly per Figure 2

(2024 IRC Section R703.11.2)

In this case, an FPIS product is secured directly to studs using a typical construction fastening schedule in accordance with the FPIS manufacturer's instructions (e.g., typically plastic cap nails at 12"oc on edges and 16"oc in the field). The vinyl siding is then secured over and fastened through the FPIS to framing members to provide permanent securement and wind load resistance as a wall covering assembly in accordance with 2024 IRC Section R703.11.2.

Because the vinyl siding attachment also supplements the FPIS attachment for wind load resistance as a wall covering assembly, the vinyl siding's required wind pressure rating is generally adjusted to be more stringent than that required for Condition 1 (above) or Condition 2, Option B (below). The more stringent design wind load pressure rating requirements for vinyl siding are found in 2024 IRC Section R703.11.2 (see Table 1 below).

Simply verify that the design wind load pressure rating for the specified vinyl siding product (as identified in Step 1) meets or exceeds the minimum tabulated rating in Table 1. Once verified, install the siding over the FPIS in accordance with the siding manufacturer's installation instructions with fasteners of sufficient length to accommodate the FPIS thickness and maintain the required fastener embedment in framing materials.

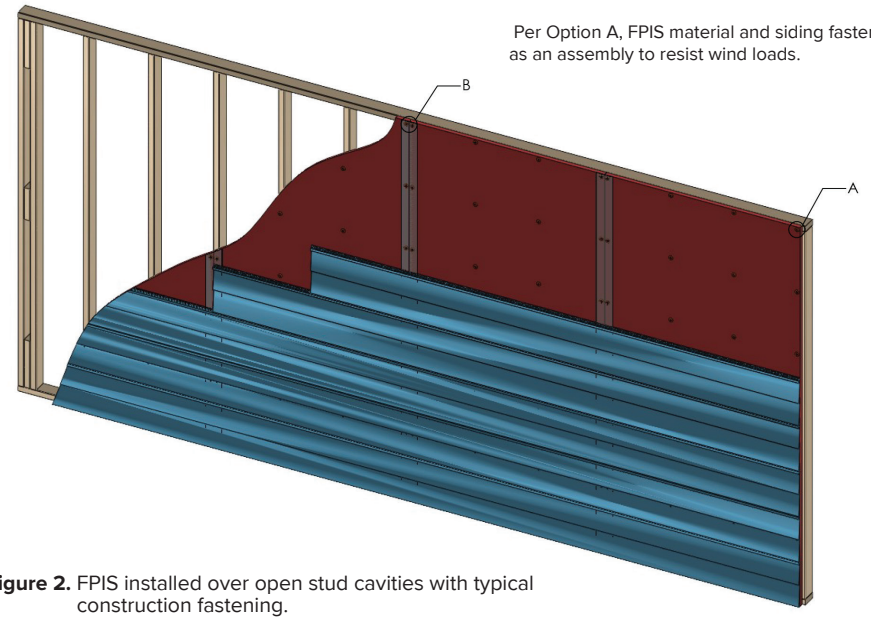

Figure 2. FPIS installed over open stud cavities with typical construction fastening.

Table 1. Required Minimum Wind Load Design Pressure Rating for Vinyl Siding Installed Over Foam Plastic Sheathing Alone *(based on IRC Table R703.11.2)* — Applies to Condition 2, Option A Only

ULTIMATE DESIGN WIND SPEED (MPH)	ADJUSTED MINIMUM DESIGN WIND PRESSURE (ASD) (PSF)[a,b]					
	Case 1: With interior gypsum wallboard[c]			Case 2: Without interior gypsum wallboard[c]		
	Exposure			Exposure		
	B	C	D	B	C	D
≤ 95	-30.0	-33.2	-39.4	-33.9	-47.4	-56.2
100	-30.0	-36.8	-43.6	-37.2	-52.5	-62.2
105	-30.0	-40.5	-48.1	-41.4	-57.9	-68.6
110	-31.8	-44.5	-52.8	-45.4	-63.5	-75.3
115	-35.5	-49.7	-59.0	-50.7	-71.0	-84.2
120	-37.4	-52.4	-62.1	-53.4	-74.8	-88.6
130	-44.9	-62.8	-74.5	-64.1	-89.7	-106
> 130	See Note d					

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 square foot = 0.0929 m^2, 1 mile per hour = 0.447 m/s, 1 pound per square foot = 0.0479 kPa

a. Linear interpolation is permitted.
b. The table values are based on a maximum 30-foot mean roof height, and effective wind area of 10 square feet Wall Zone 5 (corner), and the ASD design component and cladding wind pressure from Table R301.2.1(1), adjusted for exposure in accordance with Table R301.2.1(2), multiplied by the following adjustment factors: 1.87 (Case 1) and 2.67 (Case 2).
c. Gypsum wallboard, gypsum panel product or equivalent.
d. For the indicated wind speed condition and where foam sheathing is the only sheathing on the exterior of a frame wall with vinyl siding, the wall assembly shall be capable of resisting an impact without puncture at least equivalent to that of a wood frame wall with minimum $^{7}/_{16}$-inch OSB sheathing as tested in accordance with ASTM E1886. The vinyl siding shall comply with an adjusted design wind pressure requirement in accordance with Note b, using an adjustment factor of 2.67.

NOTE: The required minimum wind load design pressure rating in Table 1 depends on whether or not interior gypsum wall board is present. The interior gypsum wall board and the layers of the exterior wall covering assembly each resist a portion of the total wind load pressure acting on the overall wall assembly. When the interior gypsum wall board is not present, the portion of the total wind loading on the exterior wall covering layers increases as shown in the Table. For more information, refer to commentary in ASCE 7 Section C30.1.5 and discussion on pressure equalization in the appendix of ASTM D3679.

Option B: FPIS material *and* its fastening are capable of resisting full design wind pressure per Figure 3

(2024 IRC Section R703.11.2, Exception 3)

In this option the FPIS material *and* its fastening are specified to resist the full or total design wind load pressure acting on the wall assembly, just as required for other structural sheathing materials. For the vinyl siding, simply install it over the FPIS in accordance with 2024 IRC Section R703.11.1 and the siding manufacturer's installation instructions. Then verify the vinyl siding's wind pressure rating as required in Condition 1 where FPIS is installed as "over-sheathing." Also verify that the siding fasteners are long enough to accommodate the FPIS thickness and maintain the minimum required embedment in framing materials.

The design wind pressure rating and fastening schedule for the FPIS product must resist the code-required design wind pressure (see 2024 IRC Tables R301.2.1(1) and R301.2.1(2) and Figure R301.2(2)). The design wind pressure rating of the FPIS material and its fastening schedule for the intended wall stud spacing (e.g., 16" oc or 24" oc) must comply with 2024 IRC Section R303.8 (or Section R316.8 in earlier editions) and the ANSI/ABTG FS100 Standard. This code compliance and installation information should be obtained from the FPIS manufacturer.

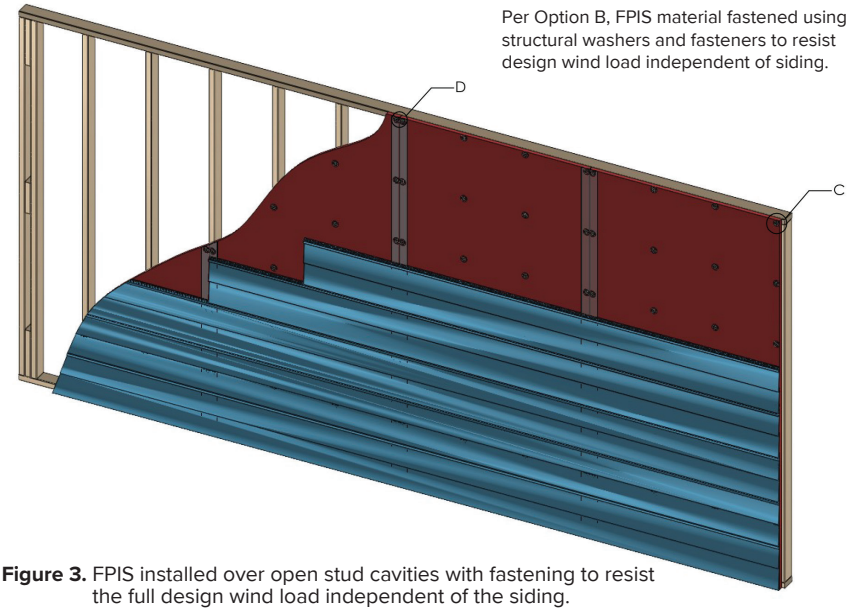

Figure 3. FPIS installed over open stud cavities with fastening to resist the full design wind load independent of the siding.

CONDITION 3:
VINYL SIDING INSTALLED OVER FPIS IN ACCORDANCE WITH THE SIDING MANUFACTURER'S INSTALLATION INSTRUCTIONS

(2024 IRC Section R703.11.2, Exception 2)

Where vinyl siding manufacturer installation instructions address a specific condition for installation over FPIS, these instructions and the applicable wind load pressure rating shall be used to demonstrate compliance.

STEP 3: VERIFY INSTALLATION IN THE FIELD.

Based on the installation condition and option chosen and the applicable code-compliance requirements determined in Steps 1 and 2 above, verify that the specified vinyl siding material, FPIS material, and their attachment schedules are correctly implemented in the field.

As a minimum recommended practice, conduct an inspection at the beginning of the FPIS and siding installations to ensure the overall wall covering assembly installation is compliant with the code.

You are well on your way to a code-compliant, durable, and high-performance wall covering as shown in Photo 2.

TIP: For additional information and guidance on code-compliant use of FPIS as a water-resistive barrier system, as a means to control water vapor, meet or exceed energy code requirements, and more, go to **continuousinsulation.org**.

Photo 2. Code-compliant installations of vinyl siding over FPIS ci.

Contact us.

Owned and operated by the Applied Building Technology Group with support from the Foam Sheathing Committee (FSC) of the American Chemistry Council, **continuousinsulation.org** provides informational resources intended to assist the foam plastic insulating sheathing industry, using sound science to develop research supporting the reliable, efficient, and economic design and installation of foam sheathing.