

ICC-ES Evaluation Report

ESR-1473

Reissued September 1, 2011

This report is subject to renewal in two years.

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**DIVISION: 06 00 00—WOOD, PLASTICS, AND
COMPOSITES**
Section: 06 16 00—Sheathing
**DIVISION: 07 00 00—THERMAL AND MOISTURE
PROTECTION**
Section: 07 30 05—Roofing Felt and Underlayment
REPORT HOLDER:

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EVALUATION SUBJECT:
ZIP SYSTEM® AND ZIP SYSTEM+™ ROOF SHEATHING

1.0 EVALUATION SCOPE

Compliance with the following codes:

- 2009 *International Building Code*® (2009 IBC)
- 2009 *International Residential Code*® (2009 IRC)
- 2006 *International Building Code*® (2006 IBC)
- 2006 *International Residential Code*® (2006 IRC)

Properties evaluated:

- Structural—wind uplift resistance
- Nonclassified roof covering
- Classified roof covering
- Weather resistance

2.0 USES

ZIP System® and ZIP System+™ roof sheathing panels are used as combination roof sheathing and roof underlayment.

3.0 DESCRIPTION

The ZIP System® and ZIP System+™ roof Sheathing panels are wood structural panels having a laminated facer. The ZIP System+™ panels are manufactured using a different resin than the Zip System® panels. The panels may also be laminated on the underside with an optional sheet radiant barrier complying with ICC-ES AC220. The panels are installed with a proprietary seam tape, which allows the systems to be used as an alternate to the

underlayment required in Chapter 15 of the IBC and Chapter 9 of the IRC. The OSB substrate complies with U.S. Doc PS-2 for wood structural panels and is overlaid on one side with a medium-density, phenol-impregnated, kraft paper overlay. The standard-size panels are nominally 4 feet by 8 feet (1220 mm by 2440 mm). Oversize panels, wider than 4 feet (1219 mm) or longer than 8 feet (2438 mm), or both, are also produced. The panels are available with either a square-finished-edge profile a tongue-and-groove edge profile or a machined edge profile. The proprietary seam tape is a self-adhering sheet-type membrane consisting of acrylic adhesive laminated to a polyolefin backing, and the face of the tape is labeled with ESR-1473. The tape is 0.012 inch thick (0.30 mm) with a minimum width of 3 inches (76.2 mm), and comes in rolls of varying length.

4.0 INSTALLATION

4.1 General:

Installation of ZIP System® and ZIP System+™ roof sheathing must comply with the applicable code, this report and the manufacturer's published installation instructions. The installation instructions are to be available at the jobsite at all times during installation. The instructions within this report must govern if there are any conflicts between the manufacturer's published instructions and this report.

4.2 Application:

The ZIP System® and ZIP System+™ roof sheathing panels must be installed with the longer dimension perpendicular to the roof framing and fastened to the roof framing in accordance with the applicable code for wood structural panels. The panels must be installed in accordance with the panel span rating as shown on the panels. All corners are to be securely fastened. Tongue-and-groove and machined edge panels are designed to provide the correct gap size at the panel edges during installation. Squared-edged panels must be spaced apart a minimum of $\frac{1}{8}$ inch (3.18 mm) at the time of installation. End joints of adjacent panel runs must be staggered. The panel must be installed with the laminated phenol-impregnated kraft paper facing to the exterior. All ZIP System® and ZIP System+™ roof sheathing seams must be sealed with the Zip System® tape. All overlay surfaces must be free of any significant presence of debris, particles or sawdust prior to installation of the ZIP System® tape. Overlay surfaces must be void of any free water prior to application of the ZIP System® tape. The ZIP System® tape edges must be sealed and the tape is to be centered within $\pm \frac{1}{2}$ inch (12.7 mm) of all panel edge seam centers. All

ZIP System® and ZIP System+™ roof sheathing surface defects, openings, cracks, etc., that completely penetrate the overlay and substrate, and caused by handling or construction work, must be covered with the ZIP System® tape. The ZIP System® tape must extend a minimum of 1 inch (25.4 mm) past the panel edge T-joint intersections. The ZIP System® tape must be adhered to the ZIP System® and ZIP System+™ roof sheathing. Wrinkles must not be present in the applied tape that extends to the panel seam.

4.3 Roof Assemblies

4.3.1 Classified Roof Coverings

4.3.1.1 Class A: Underlayment is not required for a minimum 1/2-inch thick Zip System+™ roof sheathing with Class A asphalt glass fiber mat shingles.

4.3.1.2 Class B: Underlayment is not required for a minimum 1/2-inch thick Zip System® roof sheathing with Class A asphalt glass fiber mat shingles.

4.3.2 Nonclassified Roof Coverings: The ZIP System® and ZIP System+™ roof sheathing panels are limited to installation on buildings permitted to have nonclassified roof coverings using code-complying asphalt-fiberglass shingles, metal shingles, metal panels, wood shakes, wood shingles, built-up roofing, slate and slate-type shingles, and clay and concrete tile roof coverings. Roof coverings may be applied directly to the taped ZIP System® and ZIP System+™ roof panels unless multi-layer underlayments are required.

4.4 Wind Uplift Resistance:

Wind uplift design loads and ZIP System® and ZIP System+™ roof wood structural panel allowable uplift resistance shall be determined in accordance with Sections 1609 and 2304.7.2 of the IBC and Section R301.2.1 of the IRC. Roof coverings must be fastened to the sheathing with sufficient fasteners to resist the design uplift load.

5.0 CONDITIONS OF USE

The ZIP System® and ZIP System+™ roof sheathing panels described in this report comply with, or are suitable alternatives to what is specified in, those codes listed in Section 1.0 of this report, subject to the following conditions:

- 5.1 This evaluation report and the manufacturer's published installation instructions, when required by the code official, must be submitted at the time of permit application.
- 5.2 The ZIP System® and ZIP System+™ roof sheathing panels must be manufactured, identified and installed in accordance with this report and the manufacturer's published installation instructions.
- 5.3 The ZIP System® and ZIP System+™ roof sheathing panels are limited to code-approved structural use for wood structural panels with either a 24/16, 32/16 or 40/20 span rating.

5.4 In jurisdictions enforcing the IBC, the roof covering system incorporating the panels is limited to installations in the following construction types:

- Type III-B and Type V-B
- Type III-A or Type V-A under the conditions specified in footnote d of 2009 IBC, Table 601 (footnote e in the 2006 IBC)
- Type III-A or Type V-A under the conditions specified in footnote b of 2009 IBC, Table 601, (footnote c in the 2006 IBC) for occupancies other than Group F-1, H, M and S-1

In jurisdictions enforcing the IRC, the roof covering system incorporating the panels may be installed on structures constructed in accordance with the IRC.

5.5 Enclosed attics and rafter spaces must be ventilated in accordance with the applicable code, except where unvented conditioned attic assemblies are permitted by IRC Section R806.4.

5.6 An ice barrier must be provided as required by Section 1507.2.8.2 of the IBC and Section R905.2.7.1 of the IRC.

5.7 Installation is limited to roofs having a slope of 2:12 (16.67% slope) or greater.

5.8 ZIP System® and ZIP System+™ roof sheathing panels are manufactured by Huber Engineered Woods, LLC, in Crystal Hill, Virginia; Commerce, Georgia; Broken Bow, Oklahoma; Easton, Maine; and Whites Creek (Spring City), Tennessee, under a quality control program with inspections by TECO (AA-654).

6.0 EVIDENCE SUBMITTED

Data in accordance with the ICC-ES Acceptance Criteria for Wood Structural Panel Roof Sheathing Factory-laminated with an Alternative Roof Underlayment (AC266), dated May 2008, editorially updated September 2010.

7.0 IDENTIFICATION

Each ZIP System® and ZIP System+™ roof sheathing panel covered by this report must bear a label that includes the manufacturer's name (Huber Engineered Woods, LLC) and address, the product name, the evaluation report number (ESR-1473), the grade and bond classification, the name of the inspection agency (TECO) and the name of the agency listing the panels for roof classification (Underwriters Laboratories Inc.).

The panel mill label and span rating label must be visible on the bottom face of panels, opposite the laminated facer. Panels laminated with an optional sheet radiant barrier on the underside of the panels must allow access to the grade stamp of the substrate below or must be relabeled with a screen printing onto the radiant panel or a label (sticker type) on the finished product showing the mill label and span rating.

The ZIP System® tape roll is labeled with the product name and the evaluation report number (ESR-1473).

ICC-ES SAVE: Verification of Attributes Report™**VAR-1012**

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COMPOSITES****Section: 06 16 00—Sheathing****DIVISION: 07 00 00—THERMAL AND MOISTURE
PROTECTION****Section: 07 25 00—Water-Resistive Barriers/Weather
Barriers****REPORT HOLDER:**

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EVALUATION SUBJECT:

**ADVANTECH® (AT-SERIES) SHEATHING SPAN;
ADVANTECH® (AT-SERIES) FLOOR SPAN; ZIP SYSTEM®
ROOF SHEATHING; ZIP SYSTEM® WALL SHEATHING**

1.0 EVALUATION SCOPE**Compliance with the following evaluation guidelines:**

- ICC-ES Evaluation Guideline for Determination of Biobased Material Content (EG102), dated October 1, 2008 (editorially revised July 2009).
- ICC-ES Evaluation Guideline for Determination of Regionally Extracted, Harvested or Manufactured Materials or Products (EG104), dated October 1, 2008
- ICC-ES Evaluation Guideline for Determination of Formaldehyde Emissions of Composite Wood and Engineered Wood Products (EG108), dated October 1, 2008 (editorially revised July 2009).
- ICC-ES Evaluation Guideline for Determination of Certified Wood and Certified Wood Content in Products (EG109), dated October 1, 2008.

Compliance eligibility with the applicable sections of the following green building rating systems, standards and codes:

- National Green Building Standard (ICC 700-2008) (see Table 2 for details)
- LEED for Homes 2008 (see Table 3 for details)
- LEED 2009 for New Construction and Major Renovations (see Table 4 for details)

- LEED 2009 for Schools New Construction and Major Renovations (see Table 5 for details)
- 2010 California Green Building Standards Code (CALGreen), Title 24, Part 11 (see Table 6 for details)
- International Green Construction Code – Public Version 2.0 (IGCC PV2.0) (see Table 7 for details)
- ANSI/GBI 01-2010 – Green Building Assessment Protocol for Commercial Buildings (see Table 8 for details)

2.0 USES

AdvanTech® (AT-Series) Sheathing Span, AdvanTech® (AT-Series) Floor Span, ZIP System® Roof Sheathing and ZIP System® Wall Sheathing are used for a variety of interior and exterior framing and sheathing applications.

3.0 DESCRIPTION

AdvanTech® (AT-Series) Sheathing Span and AdvanTech® (AT-Series) Floor Span wood structural panels are Exposure 1 oriented strand board (OSB) panels manufactured with strands from a single wood species or a combination of wood species blended with an exterior-type adhesive system to comply with U.S. Voluntary Product Standard PS-2 and the applicable ICC-ES report as indicated in Table 1.

ZIP System® Roof Sheathing and ZIP System® Wall Sheathing wood structural panels are OSB panels with laminated resin-impregnated Kraft paper facers manufactured to comply with U.S. Voluntary Product Standard PS-2 and the applicable ICC-ES reports as indicated in Table 1. The panels are installed with ZIP System® self-adhering membrane tape. The tape is outside the scope of this evaluation report.

4.0 CONDITIONS**4.1 Code Compliance:**

AdvanTech® (AT-Series) Sheathing Span, AdvanTech® (AT-Series) Floor Span, ZIP System® Roof Sheathing and ZIP System® Wall Sheathing have been evaluated for compliance with the requirements of the International Codes as listed in Table 1 of this report.

4.2 Green Rating Systems, Standards and Code Eligibility:

The information presented in Tables 2 through 8 of this report provides a matrix of areas of evaluation and corresponding limitations and/or additional project-specific requirements, and offer benefit to individuals who are assessing eligibility for credits or points.

The final interpretation of the specific requirements of the respective green building rating system, standard and/or code rests with the developer of that specific rating system or standard or the Authority Having Jurisdiction, as applicable.

Compliance with items noted as “Verified Attribute” is subject to any conditions noted in the tables. Decisions on compliance with those items noted as “Eligible for Points” in Tables 2 through 8 rests with the user of this report, and those items are subject to the conditions noted. The user is advised of the project-specific provisions that may be contingent upon meeting specific conditions, and the verification of those conditions is outside the scope of this report. Rating systems or standards often provide supplemental information as guidance.

5.0 BASIS OF EVALUATION

The information in this report, including the “Verified Attribute,” is based upon the following supporting documentation:

- 5.1 ICC-ES EG102 [evaluation applies to ICC 700 Section 606.1(2); CALGreen Section A5.405.2; IGCC PV2.0 Section 503.2.4; ANSI/GBI 01-2010 Section 10.1.2.2].
- 5.2 ICC-ES EG104. [evaluation applies to ICC 700 Section 608.1; LEED Homes MR 2.2(c); LEED NC MR 5; LEED Schools MR 5; CALGreen Section A5.405.1; IGCC PV2.0 Section 503.2.5; ANSI/GBI 01-2010 Section 10.1.4.1].
- 5.3 ICC-ES EG108 [evaluation applies to ICC 700 Section 901.4(6); LEED NC IEQ 4.4; LEED Schools IEQ 4.4; IGCC PV2.0 Section 806.1].
- 5.4 ICC-ES EG109 (evaluation applies to ICC 700 Section 606.2; LEED Homes MR 2.1; LEED NC MR 7; LEED Schools MR 7; CALGreen Section A5.405.2.1; ANSI/GBI 01-2010 Section 10.3.2.1).
- 5.5 Documentation establishing and documenting all major sources of primary manufacturing energy (evaluation applies to ICC 700 Section 606.3).
- 5.6 ICC-ES [ESR-1474](#) documenting that ZIP System Wall Sheathing is equivalent to a code-prescribed water-resistive barrier (evaluation applies to ICC 700 Section 602.9).
- 5.7 Refer to ICC-ES [ESR-1474](#) for evaluation of the ZIP System Wall Sheathing as an air barrier assembly (evaluation applies to ICC 700 Section 703.2.1; LEED Homes EA 3).
- 5.8 ICC-ES reports listed in Table 1 [evaluation applies to ICC 700 Section 901.4(1); IGCC Section 806.1].

6.0 IDENTIFICATION

AdvanTech® (AT-Series) Sheathing Span, AdvanTech® (AT-Series) Floor Span, ZIP System® Roof Sheathing and ZIP System® Wall Sheathing products are identified with a stamp noting the manufacturer’s name (Huber Engineered Woods LLC) and address, the product name the manufacturing location, the ICC-ES evaluation report number (if applicable), and the name or logo of the inspection or grading agency. The report subjects are also identified on the product and/or packaging with the VAR number (VAR-1012) and the ICC-ES SAVE Mark, as applicable.

TABLE 1—REFERENCE STANDARD OR EVALUATION REPORT NUMBER FOR HUBER ENGINEERED WOODS LLC PRODUCTS

PRODUCT	REPORT NUMBER/ REFERENCE STANDARD
AdvanTech® (AT-Series) Sheathing Span AdvanTech® (AT-Series) Floor Span	ESR-1785
ZIP System® Roof Sheathing	ESR-1473 ESR-2227
ZIP System® Wall Sheathing	ESR-1474 ESR-2227

TABLES 2 THROUGH 8

Section Number	Section Intent	Possible Points	Conditions of Use to Qualify	AdvanTech Sheathing	AdvanTech Flooring	ZIP System Roof Sheathing	ZIP System Wall Sheathing
TABLE 2—SUMMARY OF AREAS OF ELEGIBILITY WITH THE NATIONAL GREEN BUILDING STANDARD (ICC 700-2008)							
602.9	Water-resistive barrier	Mandatory	Install a water-resistive barrier and/or drainage plan system behind exterior veneer and/or siding				●
606.1(2)	Two types of biobased materials are used, each for more than 1 percent of the project's projected building material cost	6	To earn 6 points products must be at least 1% of the construction material cost AND another bio-based product at 1% of material cost must be used. 1 or 3 points are available for greater than 0.5%	●	●	●	●
606.2(1)	Two certified wood-based products are used for minor elements of the building, such as all walls, floors or roof	3	To earn 3 points a second certified wood product must also be used as a minor element ¹	●	●	●	●
606.2(2)	Two certified wood-based products are used for major elements of the building, such as all walls, floors or roof	4	To earn 4 points a second certified wood product must also be used as a major element ¹	●	●	●	●
606.3	Materials are used for major components of the building that are manufactured using a minimum of 33 percent of the primary manufacturing process energy derived from renewable sources, combustible waste sources, or renewable energy credits	2 each 6 max	To earn 6 points the products must be used for at least 3 major components of the building. 2 points may be earned when used for each major component.	●	●	●	●
608.1	Indigenous materials	2 each 10 max	To earn 2 points verify local products are originated, produced, grow naturally or occur naturally within 500 miles (805 km) of job site. Regional material calculations based on project location provided by Huber upon request.	○	○	○	○
703.2.1	Insulation and air sealing	3 15 max	Insulation and air sealing is installed in accordance with all the following, as applicable: (1) third-party verification performed 15 pts, no third-party verification performed 3 pts (2)				○
901.4(1)	Structural plywood used for floor, wall, and/or roof sheathing complies with DOC PS 1 and/or DOC PS 2. OSB used for floor, wall, and/or roof sheathing complies with DOC PS 2. The panels are made with moisture-resistant adhesives and the trademark indicates the adhesives are Exposure 1 or Exterior (plywood) and Exposure 1 (OSB)	Mandatory	To meet this a minimum of 85% of OSB or plywood in the building must consist of Huber products	●	●	●	●
901.4(6)	Non-emitting products, which can include structural wood framing	4	A minimum of 85% of product in the building are the identified Huber products	●	●	●	●

- = Eligible for points
- = Verified attribute
-
 = This provision does not apply to this product

Note: Footnotes are located after Table 8.

TABLES 2 THROUGH 8 (Continued)

Section Number	Section Intent	Possible Points	Conditions of Use to Qualify for Points	AdvanTech Sheathing	AdvanTech Flooring	ZIP System Roof Sheathing	ZIP System Wall Sheathing
TABLE 3—SUMMARY OF AREAS OF ELEGIBILITY WITH USGBC'S LEED FOR HOMES 2008							
EA 3	Air Infiltration	3 max	To earn 2 or 3 points meet the air leakage requirements shown in Table 17 of the standard, as applicable	○	○	○	○
MR 2.1	FSC certified tropical wood	0.5 each 8 max	To earn 0.5 point per component use FSC-certified tropical wood ²	2	2	2	2
MR 2.2(c)	Environmentally preferable products for roof, wall and floors; interior and exterior framing and sheathing	0.5 each 8 max	To earn points use products that are extracted, processed and manufactured within 500 miles (805 km) of the site for a minimum of 90% (by weight or volume of the component. Regional material calculations based on project location provided by Huber upon request.	○	○	○	○
TABLE 4—SUMMARY OF AREAS OF ELEGIBILITY WITH USGBC'S LEED 2009 FOR NEW CONSTRUCTION AND MAJOR RENOVATION							
MR 5 (MR 5.1)	Regional materials (10% of content)	1	To earn 1 point use products that are extracted, processed and manufactured within 500 miles (805 km) of the site for a minimum of 10% (by cost) of total materials value. To earn 2 points use a minimum of 20%. Regional material calculations based on project location provided by Huber upon request.	○	○	○	○
MR 5 (MR 5.2)	Regional materials (20% of content)	2		○	○	○	○
MR 7	Certified wood	1	To earn 1 point use a minimum 50% (based on cost) of wood-based materials/products certified to FSC requirements ²	2	2	2	2
IEQ 4.4	Low emitting materials	1	To earn 1 point use wood composite wood products containing no-added urea-formaldehyde resins	●	●	●	●
TABLE 5—SUMMARY OF AREAS OF ELEGIBILITY WITH USGBC'S LEED 2009 FOR SCHOOLS NEW CONSTRUCTION AND MAJOR RENOVATION							
MR 5 (MR 5.1)	Regional materials (10% of content)	1	To earn 1 point use products that are extracted, processed and manufactured within 500 miles (805 km) of the site for a minimum of 10% (by cost) of total materials value. To earn 2 points use a minimum of 20%. Regional material calculations based on project location provided by Huber upon request.	○	○	○	○
MR 5 (MR 5.2)	Regional materials (20% of content)	2		○	○	○	○
MR 7	Certified wood	1	To earn 1 point use a minimum 50% (based on cost) of wood-based materials/products certified to FSC requirements ²	2	2	2	2
IEQ 4.4	Low emitting materials	1	To earn 1 point use wood composite wood products containing no-added urea-formaldehyde resins	●	●	●	●
○	= Eligible for points						
●	= Verified attribute						
	= This provision does not apply to this product						

Note: Footnotes are located after Table 8.

TABLES 2 THROUGH 8 (Continued)

Section Number	Section Intent	Possible Points	Conditions of Use to Qualify for Points	AdvanTech Sheathing	AdvanTech Flooring	ZIP System Roof Sheathing	ZIP System Wall Sheathing
TABLE 6—SUMMARY OF AREAS OF ELEGIBILITY WITH 2010 CALIFORNIA GREEN BUILDING STANDARDS CODE							
705.1	Regional materials	N/A	Verify local products that are extracted, processed and manufactured within California or 500 miles (805 km) of the job site. Regional material calculations based on project location provided by Huber upon request.	○	○	○	○
705.2	Bio-based materials	N/A	All Huber wood products are qualified as biobased	●	●	●	●
705.2.1	Certified Wood	N/A	Under review by California Building Standards Commission ³	N/A	N/A	N/A	N/A
707.1	Water-resistant exterior wall assembly	N/A	Huber products provide a water-resistant exterior wall envelope				○
804.4.4	Composite wood product emissions	N/A	EWP products do not apply to the composite wood product definition ⁴				
TABLE 7—SUMMARY OF AREAS OF ELEGIBILITY WITH INTERNATIONAL GREEN CONSTRUCTION CODE – PUBLIC VERSION 2.0 (IGCC PV2.0)							
503.2.4(2)	Biobased products	N/A	All Huber wood products are qualified as biobased	●	●	●	●
503.2.5	Indigenous materials	N/A	To earn credits use products that are extracted, processed and manufactured within 500 miles (805 km) of the site for a minimum of 90% (by weight or volume of the component. Regional material calculations based on project location provided by Huber upon request.	○	○	○	○
606.1.2.1.1	Air barrier installation		Install the system in accordance with the manufacturer's installation instructions and ICC-ES evaluation report ESR-1474				●
806.1	Formaldehyde emissions	N/A	Huber wood structural panels comply with US DOC PS 2 (See Table 1 of this report) and meet the requirements of Table 806.1	●	●	●	●
TABLE 8—SUMMARY OF AREAS OF ELEGIBILITY WITH ANSI/GBI 01-2010 – GREEN BUILDING ASSESSMENT PROTOCOL FOR COMMERCIAL BUILDINGS							
10.1.2.2	Biobased Products - building assemblies	7 max	All Huber wood products are qualified as biobased	●	●	●	●
10.1.4.1	Regional Materials - building assemblies	5 max	To earn credits use products that are extracted, processed and manufactured within 500 miles (805 km) of the site for a minimum of 90% (by weight or volume of the component. Regional material calculations based on project location provided by Huber upon request.	○	○	○	○
10.3.2.1	Certified wood	6	Between 10% and 60% or more of wood-based products used in the building are third party certified	●	●	●	●
○	= Eligible for points						
●	= Verified attribute						
	= This provision does not apply to this product						

¹Certification is required of the manufacturer only. Vendor Chain of Custody is not required to qualify for this point.

²Forest certification credit currently resources FSC exclusively. Credit of other certification schemes may be at the discretion of the verifier.

³CGBSC recognizes importance of use of certified forest products however the specific requirements are currently under development.

⁴This area is not to be confused with the provisions of EQ 4.4 in LEED (Table 4) because the California Air Resources Board (CARB) does not regulate engineered wood product emissions.

N/A = Not applicable