HORTON WORLD SOLUTIONS, LLC
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HORTON WORLD SOLUTIONS PANELS

CSI Section:
07 21 00 Thermal Insulation
07 21 13 Board Insulation
07 42 00 Wall Panels
07 42 43 Composite Wall Panels
07 44 00 Faced Panels
07 44 63 Fabricated Faced Panel Assemblies

1.0 RECOGNITION

Horton World Solutions (HWS) Panels recognized in this report have been evaluated for use as non-load bearing infill wall panels. The manufacturing installed composite lamina facings in this report have been evaluated for properties relevant to water-resistive barriers. The structural performance, thermal resistance, fastener capacities, and tensile strength properties of the HWS panels and the durability, physical properties, water vapor transmission, and water resistance of the composite lamina facings, comply with the intent of the provisions of the following standards and regulations, as applicable:

- ASTM E330-14 Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights, and Curtain Walls by Uniform Static Air Pressure Difference.
- ASTM C518-17 Standard Test for Steady-State Thermal Transmission Properties by means of the Heat Flow Meter Apparatus
- ASTM D1622-98 Standard Test Method for Apparent Density of Rigid Cellular Plastics
- ASTM C297-16 Standard Test Method for Flatwise Tensile Strength of Sandwich Constructions
- ASTM D1037-12(2020) Standard Test Method for Evaluating Properties of Wood-Base Fiber and Particle Panel Materials.
- ASTM E2556-10(2016) Specification for Vapor Permeable Flexible Sheet Water-Resistive Barriers Intended for Mechanical Attachments. (Composite Lamina Only)
- ASTM G154-16 Standard Practice for Operating Fluorescent Ultraviolet (UV) Lamp Apparatus for Exposure of Nonmetallic Materials. (Composite Lamina Only)
- ASTM D882-10 Standard Test Method for Tensile Properties of Thin Plastic Sheeting. (Composite Lamina Only)
- ASTM D779-03 Standard Test Method for Water Resistance of Paper, Paperboard, and Other Sheet Materials by the Dry Indicator Method. (Composite Lamina Only)

2.0 LIMITATIONS

The use of HWS Panels and the performance as described in this report, when tested in accordance with the standards in Section 1 of this report, is subject to the following limitations.

2.1 HWS Panels shall be installed in accordance with this report, the manufacturer's published installation instructions, and the applicable standard. In the event of a conflict, the most restrictive shall govern.

2.2 Panel connections and design of those connections to supporting substrates and structures are outside the scope of this report.

2.3 HWS Panel performance is based on testing 2-inch-thick (51 mm) and 4-inch-thick (101 mm) panels as described in this report, as applicable.

2.4 The HWS Panels recognized in this report shall be manufactured in South Lake, Texas, and identified in accordance with this report.

3.0 PRODUCT USE

3.1 General: HWS Panels shall be used as infill and insulation panels attached to an approved sub-construction. The panels may be used to resist distributed loads when required as detailed in Section 3.2.2 of this report.

3.2 Design: The following design properties of HWS Panels have been established through testing.

3.2.1 Thermal Resistance and Density: HWS Panels with a nominal thickness of 2 inches (51 mm) have thermal resistances (R-Value) at a mean temperature of 75°F ± 5° F (23.8°C ± 2.8 °C) of 4.468 F°ft2 h/Btu (30.98 mK/W). HWS Panels with a nominal thickness of 4 inches (101 mm) have thermal resistances (R-Value) at a mean temperature of 75°F ± 5° F (23.8°C ± 2.8 °C) of 5.245 F°ft2 h/Btu (36.37 mK/W). The average density of the extruded polystyrene insulation is 1.98 pcf (31.72 kg/m^3).

3.2.2 Structural Performance: HWS Panels that are 4 inches (101 mm) thick with maximum dimensions of 8-feet-long (2.44 m) by 8-feet-wide (2.44 m) have the structural performance, when evaluated with static air pressure, as described in Table 1 of this report. The assembly details are described in Section 3.4.2 of this report.

3.2.3 Fastener Withdrawal: The results of testing in accordance with ASTM D1037 for withdrawal of the fasteners when installed at a specific depth are described in Table 2 of this report.

3.2.4 Head Pull-Through: The results of testing in accordance with ASTM D1037 for head pull-through values of fasteners are described in Table 3 of this report.

3.2.5 Panel Tensile Strength: The 4-inch-thick (101 mm) HWS panels have an average tensile strength of 51 psi (355 kPa) when tested in accordance with ASTM C297.

3.3 Composite Lamina Properties: The following properties of the composite lamina facings have been established through testing.

3.3.1 Tensile Strength: The facings have a tensile strength greater than 20 lbs/in in both the machine direction and cross direction as required by ASTM E2556 when tested in accordance with ASTM D882 after accelerated aging in accordance with Section A1.2 of ASTM E2556.

3.3.2 Water Vapor Transmission: When tested in accordance with the ASTM E96 desiccant method (Procedure A), the composite lamina facing has a vapor permeance of 5.79 Perms [330 x 10^{-9} g/(pa*s*m^2)].

3.3.3 Water Resistance: The facings meet the requirements of ASTM E2556 for water resistance when tested in accordance with ASTM D779 after accelerated aging in accordance with Section A1.2 of ASTM E2556. Both control and accelerated aged samples were evaluated.

3.4 Installation and Assemblies:

3.4.1 General: The manufacturer's published instructions and this listing shall be strictly adhered to for installation. A copy of the instructions and this listing report shall be available on the job site during product installation.

3.4.2 Tested Panel Assemblies: Each of the three evaluated assemblies tested for structural performance, by uniform static air pressure, included one or two seams/unions of the XPS foam plastic. The orientation and location of the seam/union was centered on the overall panel dimension in either direction, as applicable. Each panel tested was supported using a continuous bearing of 1-inch (25.4 mm) wide on the face of the panel along all sides. Each assembly included a 93-inch (2.36 m) span length between the supports.

4.0 PRODUCT DESCRIPTION

Horton World Solutions wall panels are manufactured as structural insulated panels using composite lamina facings bonded to extruded polystyrene (XPS) cores with a density of 1.5 lb/ft^3 (24 kg/m^3) using MOR-AD™ M-652 laminating adhesive. The panels are manufactured in 2-inch (50 mm) and 4-inch (101 mm) nominal thicknesses with a maximum panel size of 8 feet (2.44 m) wide and 8 feet (2.44 m) tall. The facings are 0.055 inches thick (1.397 mm).

5.0 IDENTIFICATION

Horton World Solutions wall panels are identified by a label affixed on product packaging. The label shall include the company name (Horton World Solutions), product name or code, and listing report number (UEL-5049).

The IAPMO Uniform Evaluation Service Mark of Conformity may be used as shown below:

IAPMO UES UEL-5049

6.0 SUBSTANTIATING DATA

6.1 Reports of structural performance in accordance with ASTM E330.

6.2 Reports of tensile strength testing in accordance with ASTM C297.

6.3 Reports of thermal resistance testing in accordance with ASTM C518.

6.4 Reports of apparent density testing in accordance with ASTM D1622.

6.5 Reports of fastener strength testing in accordance with ASTM D1037.

6.6 Reports of tensile strength testing in accordance with ASTM D882.

6.7 Reports of water-resistance testing in accordance with ASTM D779.

6.8 Reports of accelerated aging testing in accordance with ASTM E2556.

6.9 Test reports are from laboratories in compliance with ISO/EC 17025.

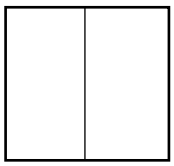
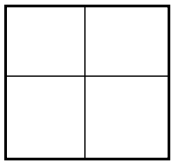
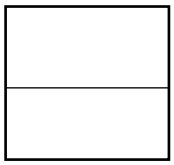
7.0 STATEMENT OF RECOGNITION

This listing report describes the results of research completed by IAPMO Uniform Evaluation Service on Horton World Solutions panels conforming to the standards shown in Section 1.0 of this report and serves as documentation of the

product certification. Products are manufactured at the location noted in Section 2.4 of this report under a quality control program with periodic inspection under the supervision of IAPMO UES.

For additional information about this Listing Report please visit
www.uniform-es.org or email us at info@uniform-es.org

TABLE 1-Structural Performance by Static Air Pressure

Panel Assembly[1]	Panel Assembly Illustration	Panel Size and Span Length	Maximum Pressure at deflection limits (psf)		Ultimate Pressure[2] (psf)
XPS Seam/Union: Middle of panel vertical top to bottom.		Panel Size: 8 feet by 8 feet Span Length: 93 inches	L/180	34	113
			L/240	26	
			L/360	18	
XPS Seam/Union: Middle of panel horizontal side to side and vertical side to side.		Panel Size: 8 feet by 8 feet Span Length: 93 inches	L/180	30	68
			L/240	23	
			L/360	16	
XPS Seam/Union: Middle of panel horizontal side to side.		Panel Size: 8 feet by 8 feet Span Length: 93 inches	L/180	24	76
			L/240	18	
			L/360	12	

For S.I.: 1lbf= 4.4 N: 1 inch = 25.4 mm; 1 psf = 4.79 mPa
1. Additional Details on the assembly in Section 3.3.2 of this report.
2. Pressures do not have a safety factor incorporated.

TABLE 2-Fastener Withdrawal Values for 4 inch Panels[1,2]

Fastener	Withdrawal Values[1] (lbf)
PowerHead #10-1 ½" screw	73
#8 x 1 5/8" Lath screw	70
#8 x 2-1/2" Coarse thread drywall screw	74

For S.I.: 1lbf= 4.4 N: 1 inch = 25.4 mm
1. Values do not have a safety factor incorporated.
2. Values other than those tested are outside the scope of this report

TABLE 3-Fastener Head Pull-Through Values for 4 inch Panels[1,2]

Fastener	Pull-Through Values[1] (lbf)
6" x ¼" SPAX Screw	587
HeadLok 6" x 3/8"	412

For S.I.: 1lbf= 4.4 N: 1 inch = 25.4 mm; 1 psf = 4.79 mPa
1. Values do not have a safety factor incorporated.
2. Values other than those tested are outside the scope of this report