



DIVISION: 07 00 00—THERMAL AND MOISTURE PROTECTION

Section: 07 40 00—Roof and Siding Panels

REPORT HOLDER:

URBAN INDUSTRIES, INC.

EVALUATION SUBJECT:

SNAPLOCK PANELS, 8-FT TO 18-FT LONG, 3-IN. TO 6-IN. THICK METAL ROOF PANELS

1.0 EVALUATION SCOPE

Compliance with the following codes:

- 2015 and 2012 *International Building Code*® (IBC)
- 2015 and 2012 *International Residential Code*® (IRC)

Properties evaluated:

- Structural
- Surface-burning characteristics
- Roof classifications

2.0 USES

2.1 General:

Snaplock Panels are structural insulated roof panels, intended for use as load-bearing or non-load bearing roof panels of patio covers in accordance with IBC Appendix I and IRC Appendix H.

2.2 Construction Types:

Snaplock Panels shall be considered combustible building elements when determining the Type of Construction in accordance with 2015 IBC Chapter 6.

2.3 Fire Classification

Snaplock Panels have a Class C roof classification when tested in accordance with ASTM E108. The maximum installed roof slope for the Class C roof classification is 5:12.

3.0 DESCRIPTION

3.1 General:

Snaplock Panels are factory-assembled, metal faced structural insulated panels (SIPs) with an expanded polystyrene (EPS) foam core. Snaplock Panels are available in 3-inch through 6-inch (76 mm to 152 mm) overall thicknesses and are custom made to the specifications for each use. The maximum panel size is 4 feet (1219 mm) wide and 8 feet to 18 feet (2438 mm to 5486 mm) in length.

3.2 Materials:

3.2.1 Facing: The facing consists of 3105 aluminum, conforming to ASTM B209, with a base-metal thickness of 0.023 inch (0.58 mm), minimum elongation of 3%, minimum yield strength of 19 ksi (131 MPa), and minimum tensile strength of 23 ksi (159 MPa).

3.2.2 Core: The core material is EPS foam plastic insulation conforming to ASTM C578, Type II. The foam, up to 4 inches (102 mm) thickness, has a flame spread rating not exceeding 75 and a smoke-developed index not exceeding 450 when tested in accordance with ASTM E84.

3.2.3 Adhesive: Facing materials are adhered to the core material using a thin-film adhesive. The adhesive is applied during the lamination process in accordance with the in-plant quality system documentation.

4.0 DESIGN AND INSTALLATION

4.1 Design:

4.1.1 General: The scope of this report is limited to the evaluation of the Snaplock Panels. Panel connections and other details related to incorporation of the panel into the overall structural system of a building are beyond the scope of this report.

4.1.2 Design Loads: Design loads to be resisted by the Snaplock Panels shall be as required under the applicable building code. Loads on the panels shall not exceed the allowable loads noted in this report.

4.1.3 Allowable Loads: Allowable transverse loads may be calculated using the panel properties provided in Tables 1 and 2 or may be selected from Table 3. The panel lengths and thicknesses are limited as provided in Tables 2 and 3. Unless otherwise noted, all properties and allowable loads apply to panels joined with a tongue and groove connection. Allowable loads for reinforced panel capacities shall be designed by the registered design professional.

4.1.4 Openings: Openings in panel is beyond the scope for this report and shall be reinforced with wood or steel designed in accordance with accepted engineering practice to resist all loads applied to the opening as required by the applicable code. Details for door and window openings shall be provided to clarify the manner of supporting loads at openings. Such details shall be shown on the construction documents and subject to approval by the local authority having jurisdiction.

4.2 Installation:

4.2.1 General: Snaplock Panels shall be fabricated, identified and erected in accordance with this report, the manufacturer's installation instructions, the approved construction documents and the applicable code. In the

event of a conflict between the manufacturer's installation instructions and this report, this report shall govern. Approved construction documents shall be available at all times at the jobsite during installation.

4.2.2 Channels: The exposed edges of the panels shall be flashed with not less than 10-gauge [0.1019 inch (2.69 mm)] aluminum. The channels shall be secured using not less than #10 x 1-inch-long (25 mm) self-drilling tapping screws (ASTM C1513), spaced 12 inches (305 mm) on center on both sides of the SIP with a minimum of 3/4-inch (19 mm) edge distance, or an approved equivalent fastener.

4.2.3 Cutting and Notching: No field cutting or routing of the panels shall be permitted except as shown on approved drawings.

4.2.4 Protection from Decay: Panels that rest on exterior foundation walls shall not be located within 8 inches (203 mm) of the exposed earth. Panels supported by concrete or masonry that is in direct contact with earth shall be protected from the concrete or masonry by a moisture barrier.

4.2.5 Protection from Termites: In areas subject to damage from termites, panels shall be protected from termites using an approved method. Panels shall not be installed below grade or in contact with earth.

4.2.6 Heat-Producing Fixtures: Heat-producing fixtures shall not be installed in the panels unless protected by a method approved by the code official or documented in test reports. This limitation shall not be interpreted to prohibit heat-producing elements with suitable protection.

4.2.7 Voids and Holes

4.2.7.1 Voids in Core: Voids through the core may be placed in predetermined locations only when designed in accordance with Section 5.5.

4.2.7.2 Holes in Panels: Holes may be placed in panels during fabrication at predetermined locations only when designed in accordance with Section 5.5.

4.2.8 Panel Cladding:

4.2.8.1 Roof Covering: The roof covering, underlayment and flashing shall comply with the applicable codes. All roofing materials must be installed in accordance with the manufacturer's installation instructions. The use of roof coverings requiring the application of heat during installation shall be reviewed and approved by a registered design professional.

4.2.8.2 Interior Finish: A thermal barrier, as required by the applicable code, is not required on the interior side of the roof panels.

5.0 CONDITIONS OF USE

The Snaplock Panels, 8-foot- to 18-foot-long (2438 mm to 5486 mm), 3-inch- to 6-inch-thick (76 mm to 152 mm) metal roof panels, described in this report comply with, or are a

suitable alternative to what is specified in, those codes listed in Section 1.0 of this report, subject to the following conditions:

- 5.1** Installation of the panels must comply with this report and the approved construction documents.
- 5.2** The panels are limited to use in patio covers regulated under IBC Appendix I and IRC Appendix H.
- 5.3** This report applies only to the panel thicknesses specifically listed herein.
- 5.4** In-use panel heights/spans shall not exceed the values listed herein. Extrapolation beyond the values listed herein is not permitted.
- 5.5** Construction documents including specifications, engineering plans and calculations specifying the Snaplock Panels must be submitted to the code official for approval. The construction documents must be prepared, signed and sealed by a registered design professional when required by the statutes of the jurisdiction where the project is to be constructed.
- 5.6** Engineering plans and calculations, submitted to the code official, must provide complete load path(s) for loading acting on the panels must be consistent with this report.
- 5.7** The panels are manufactured in the production facility in Galion, Ohio under a quality control program with inspections by ICC-ES.

6.0 EVIDENCE SUBMITTED

- 6.1** Report of transverse load tests of panels in accordance with the general guidelines of ASTM E72.
- 6.2** Report of surface burning characteristics test in accordance with ASTM E84.
- 6.3** Report of roof classification test in accordance with ASTM E108.

7.0 IDENTIFICATION

- 7.1** Snaplock Panels are identified with the following information:
 - 7.1.1** The ICC-ES Evaluation Report number (ESR-4649).
 - 7.1.2** Company name (Urban Industries, Inc.)
 - 7.1.3** Project or batch number.
- 7.2** The report holder's contact information is the following:

URBAN INDUSTRIES, INC.
POST OFFICE BOX 27
GALION, OHIO 44833
(800) 537-2807
www.urbanindustries.com

TABLE 1—BASIC PROPERTIES¹

Property	Strong Axis Bending
Allowable Facing Tensile Stress, F_t (psi)	11,500
Allowable Facing Compressive Stress, F_c (psi)	5760
Elastic Modulus (Bending), E_b (psi)	10,000,000
Shear Modulus, G (psi)	689
Allowable Core Shear Stress, F_v (psi)	7.3
Core Compressive Modulus, E_c (psi)	400
Reference Depth, h_o (in.)	3.0
Shear Depth Factor Exponent, m	0.040

For SI: 1 in. = 25.4 mm; 1 psi = 6.8948 kPa

¹ All properties are based on a maximum panel width of 48 inches.

TABLE 2—SECTION PROPERTIES

Panel Thickness, h (in.)	Core Thickness, c (in.)	Dead Weight, w_d (psf)	Facing Area, A_f (in. ² /ft)	Shear Area, A_v (in. ² /ft)	Moment of Inertia, I (in. ⁴ /ft)	Section Modulus, S (in. ³ /ft)	Radius of Gyration, r (in.)	Centroid-to-Facing Dist., y_c (in.)
3	2.95	1.8	0.58	35.7	1.2	0.8	1.46	1.50
4	3.95	1.9	0.58	47.7	2.2	1.1	1.96	2.00
6	5.95	2.1	0.58	71.7	5.1	1.7	2.96	3.00

For SI: 1 in. = 25.4 mm; 1 in.² = 645.2 mm²; 1 in.³ = 16 387 mm³; 1 in.⁴ = 416 231 mm⁴; 1 foot = 304.8 mm; 1 psf = 0.0478 kPa

TABLE 3—ALLOWABLE UNIFORM TRANSVERSE LOADS (PSF)^{1,3}

Panel Length (ft)	3-inch Thick SIP				4-inch Thick SIP			
	Deflection Limit ²				Deflection Limit ²			
	L/120	L/180	L/240	L/360	L/120	L/180	L/240	L/360
8	48.9	46.6	35.0	23.3	65.5	65.5	56.0	37.3
9	38.7	35.3	26.5	17.6	51.7	51.7	43.0	28.7
10	31.3	27.2	20.4	13.6	41.9	41.9	33.6	22.4
11	25.9	21.4	16.0	10.7	34.6	34.6	26.7	17.8
12	21.7	17.0	12.8	8.5	29.1	28.6	21.5	14.3
13	18.5	13.8	10.3	6.9	24.8	23.3	17.5	11.7
14	16.0	11.3	8.5	5.6	21.4	19.2	14.4	9.6
15	13.9	9.4	7.0	4.7	18.6	16.0	12.0	8.0
16	12.2	7.8	5.9	3.9	16.4	13.5	10.1	6.7
17	10.8	6.6	5.0	3.3	14.5	11.4	8.6	5.7
18	9.7	5.6	4.2	2.8	12.9	9.8	7.3	4.9

For SI: 1 ft = 304.8 mm; 1 psf = 0.0478 kPa

¹ Table values assume a simply supported panel with 1½ inches. of continuous bearing on facing at supports ($C_v = 1.0$). Values do not include the dead weight of the panel.

² Deflection limit shall be selected by building designer based on the serviceability requirements of the structure and the requirements of adopted building code. Values are based on loads of short duration only and do not consider the effects of creep.

³ Permanent loads, such as dead load, shall not exceed 0.50 times the tabulated load.

TABLE 3—ALLOWABLE UNIFORM TRANSVERSE LOADS (PSF) (CONTINUED)^{1,3}

Panel Length (ft)	6-inch Thick SIP			
	Deflection Limit ²			
	L/120	L/180	L/240	L/360
8	98.6	98.6	98.6	70.0
9	77.9	77.9	77.9	55.0
10	63.1	63.1	63.1	43.9
11	52.2	52.2	52.2	35.4
12	43.8	43.8	43.4	28.9
13	37.3	37.3	35.8	23.9
14	32.2	32.2	29.8	19.9
15	28.0	28.0	25.1	16.7
16	24.6	24.6	21.2	14.2
17	21.8	21.8	18.1	12.1
18	19.5	19.5	15.6	10.4

For SI: 1 ft = 304.8 mm, 1 psf = 0.0478 kPa

¹ Table values assume a simply supported panel with 1½ inches. of continuous bearing on facing at supports ($C_v = 1.0$). Values do not include the dead weight of the panel.

² Deflection limit shall be selected by building designer based on the serviceability requirements of the structure and the requirements of adopted building code. Values are based on loads of short duration only and do not consider the effects of creep.

³ Permanent loads, such as dead load, shall not exceed 0.50 times the tabulated load.