



# Fire Resistant Panels

## Applications

Panel Built insulated panels are factory-assembled with a fire resistant mineral fiber core bonded with metal facings, suitable for fire rated wall applications, such as: exterior wall cladding, interior partitions, liners, demising walls and boundary walls. Panels achieve one, two or three hour fire resistance ratings and are available with a unique hidden fastener for increased aesthetic architectural appeal.

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## Manufacturing Process

Panel Built panels are factory-assembled on a continuous in-line method for optimum uniformity and quality. Top and bottom pre-painted and profiled steel facings are roll-formed and bonded mechanically with thermosetting adhesive to mineral fiber insulation. The core material is cut into lamella strips, and rotated 90 degrees for perpendicular fiber orientation.

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## Insulation Core

Panel Built panels come with rigid, VOCs and CFCs free, high dimensional stability and moisture resistant mineral fiber insulation core that is bonded to steel facings. Panels are offered in thicknesses of 4", 6" and 8" providing an R-value of 3.6 per inch.

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## Facings

The exterior face is available in 24 or 22 Ga. Shadowline, Micro-Rib or V-Groove profiled embossed G-90 galvanized or Galvalume® pre-painted steel. The interior face is standard 26 Ga. Shadowline profiled embossed G-90 galvanized or Galvalume® pre-painted steel.

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## Finishes

Panel Built offers a full spectrum of vibrant colors for every color scheme. The high performance coatings provide long-life protection, color and gloss retention. Custom color matching is available to meet individual building designs and creative freedom.

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## Panel Design

Panel Built panels utilize a superior double tongue and groove interlocking rainscreen joint design with a hidden fastener anchorage affording connection of both metal skins to the building structure. The insulation core is also trimmed in a tongue and groove profile shape to allow positive insulation to insulation contact. Field applied sealant provides excellent vapor barrier and weathertightness. Sealant is optional and is not required for fire rating. Panels are available in 42" standard width and in 6' to 40' lengths.

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## Performance Requirements and Product Listings

Panel Built panels meet specific building envelope performance criteria and requirements stipulated by US and Canadian building codes. Panels are tested in accordance with UL, ULC and ASTM standards, testing methods and procedures. Panel Built panels as non-load bearing wall assembly are listed by Warnock Hersey under Design Number KIP-CWP 180-01 and KIP/PV 120-01.



Test	Procedure	Results
Fire	UL-263 ASTM E119 CAN/ULC-S101 NFPA 251	Fire rating achieved 4" panel thickness = 1 hour 6" panel thickness = 2 hour 8" panel thickness = 3 hour
	CAN/ULC-S102 (Mineral Fiber Core)	Flame spread: 0 Smoke developed: 0
	ASTM E84 (Mineral Fiber Core)	Flame spread: 0 Smoke developed: 0
Thermal Performance/ Resistance	ASTM C518	R = 3.6 °F.ft <sup>2</sup> .h/BTU.in
Weather and Vapor Barrier	ASTM E283	Air leakage <0.001 CFM/sqft at 6.24psf pressure
	ASTM E331	No uncontrolled water penetration at 12psf differential pressure
	AAMA 501-94	Panel wall assembly meets air and water tightness criteria
Structural	ASTM E72	Vacuum chamber tested
Fired Penetration	ASTM E814 CAN/ULC S-115	Listed up to 30" dia. steel pipe through penetration
Bond Strength	ASTM D1623	Panels tested for tensile bond strength of metal to foam

#### A. Performance Criteria:

1. Structural Test: Structural performance shall be verifiable by witnessed structural testing for simulated wind loads in accordance with ASTM E72. Deflection criteria shall be [L/180] [insert project specific deflection criteria].
2. Fatigue Test: There shall be no evidence of metal/insulation interface delamination when the panel is tested by simulated wind loads (positive and negative loads), when applied for two million alternate cycles of L/180 deflection.
3. Thermal Properties: The panel shall provide an R-value of 4.2 per inch thickness when tested in accordance with ASTM C518.
4. Adhesion Test: Tensile strength in accordance with ASTM D1623.
5. Penetration and Firestop Test: The finished panel with 4 inches and 6 inches thick mineral wool core and steel skins with through penetration firestop systems meet requirements of 1 hour and 2 hour fire resistance performance in accordance with ASTM E814 and UL 1479.
6. Water Penetration: There shall be no uncontrolled water penetration through the panel joints at a pressure differential of 20 psf, when tested in accordance with ASTM E331.
7. Air Infiltration: Air infiltration through the panel shall not exceed 0.001 cfm/sf at 20 psf air pressure differential when tested in accordance with ASTM E283.
8. Insulating Core:
  - a. Density: 8.5 lb. /cu. ft. +/- 10% or minimum 7.65 lb. /cu. ft., maximum 9.4 lb. / cu. ft.; in accordance with ASTM C303.
  - b. Combustibility: Non-combustible at 1382° F in accordance with ASTM E136.
  - c. Combustibility: Non-combustible when tested in accordance with ULC-S114, Flame Spread = 0, Smoke Developed = 0.
  - e. Compressive Strength: Force applied parallel to fiber orientation (cut lamella pieces) Maximum 5% deformation at 9.2 KN of force in accordance with ASTM C165.
  - f. Dimensional stability: Linear shrinkage 2% max. at 1200° F in accordance with ASTM C612.d. Apparent thermal



conductivity: Maximum “k” factor at 75° F. mean temp. - 0.24 Btu in/h ft<sup>2</sup> °F (R=4.2 ft<sup>2</sup> °F h / Btu inch thickness) in accordance with ASTM C518.

e. Compressive Strength: Force applied parallel to fiber orientation (cut lamella pieces) Maximum 5% deformation at 9.2 KN of force in accordance with ASTM C165.

f. Dimensional stability: Linear shrinkage 2% max. at 1200° F in accordance with ASTM C612.

g. Moisture resistance: Water vapor absorption - 5% max. by weight in accordance with ASTM C612.

h. Odor emission: No objectionable odor in accordance with ASTM C612.

i. Surface burning characteristics when tested in accordance with ASTM E84:

1) Flame Spread: 0

2) Smoke Developed: 0

9. Fire Test Response Characteristics: Steel-faced panels with mineral wool core shall comply with appropriate sections of Chapter 7 of the International Building Code regarding fire-resistance-rated construction. The following approval listings/test reports shall be available upon request for submission to the Authority Having Jurisdiction:

a. ASTM E119: Panels shall have successfully passed the requirements of this standard.

b. CAN/ULC-S101: Panels shall have successfully passed the requirements of this standard.

c. CAN/ULC-S115: Panel penetrations shall have successfully passed the requirements of this standard.

## **B. Exterior Paint Finish Characteristics:**

1. Gloss: 15 +/- 5 measured at 60° angle tested in accordance with ASTM D523.

2. Pencil Hardness: HB-H minimum tested in accordance with ASTM D3363.

3. Flexibility, T-Bend: 1-2T bend with no adhesion loss when tested in accordance with ASTM D4145.

4. Flexibility, Mandrel: No cracking when bent 180° around a 1/8 mandrel as tested in accordance with ASTM D522.

5. Adhesion: No adhesion loss tested in accordance with ASTM D3359.

6. Reverse Impact: No cracking or adhesion loss when impacted 3000 x inches of metal thickness (lb-in), tested in accordance with ASTM D2794.

7. Abrasion Resistance: Nominal 65 liters of falling sand to expose 5/32 inch diameter of metal substrate when tested in accordance with ASTM D968.

8. Graffiti Resistance: Minimal effect.

9. Acid Pollutant Resistance: No effect when subjected to 30% sulfuric acid for 18 hours, or 10% muriatic acid for 15 minutes when tested in accordance with ASTM D1308.

10. Salt Fog Resistance: Passes 1000 hours, when tested in accordance with ASTM B117 (5% salt fog @ 95° F).

11. Cyclic Salt Fog and UV Exposure: Passes 2016 hours when tested in accordance with ASTM D5894.

12. Humidity Resistance: Passes 1500 hours at 100% relative humidity and 95°F, with a test rating of 10 when tested in accordance with ASTM D2247 and D714.

13. Color Retention: Passes 5000 hours when tested in accordance with ASTM G153 and G154.

14. Chalk Resistance: Maximum chalk is a rating of 8 when tested in accordance with ASTM D4214, Method A.

15. Color Tolerances: Maximum of 5ΔE Hunter units on panels when tested in accordance with ASTM D2244.



### **C. Exterior Aggregate Finish Characteristics:**

1. Moisture Resistance: 14 days exposure with no deleterious effects when tested in accordance with ASTM D2274.
2. Salt Spray: 1000 hours, no deleterious effects when tested in accordance with ASTM B117.
3. Abrasion Resistance: 500 liters of sand, no deleterious effects when tested in accordance with ASTM D968.
4. Freeze/Thaw (60 cycles): No checking, cracking or splitting.
5. Mildew Resistance: (MIL STD 801B): No growth of mildew.
6. Flame Spread: <25, Class 1 rating when tested in accordance with ASTM E84.

### **D. Panel Description:**

1. Panel thickness: [4 inches] [6 inches] [8 inches] thick.
2. Panel width: 42 inches.
3. Fire Rating: [1 hour] [2 hour] [3 hour].
4. Panel joint: Tongue and groove interlock joint.
5. Reveal: 1/8 inch
6. Exterior Face of Panel:
  - a. Material:
    - 1) Steel coil material shall be in accordance with ASTM A755 [Grade 33, G90 galvanized steel in accordance with ASTM A653 and A924] [AZ50 Galvalume®/ Zinalume® (55% aluminum, 45% zinc) in accordance with ASTM A792].
  - b. Profile: [Shadowline].
    - 1) Profile description: Linear striations nominal 0.0625 inch deep by 3/4 inches wide at 3 inches on center.
  - c. Texture: [Non-directional stucco embossed] [Smooth].
  - d. Gauge: [26] [24] [22].
  - e. Profile: [Micro-Rib].
    - 1) Profile description: Micro-Rib profile has linear 0.0625 inch deep fluted striations at 3/4 inches on center.
  - f. Texture: [Non-directional stucco embossed] [Smooth].
  - g. Gauge: [24] [22].
  - h. Profile: [Azteco].
    - 1) Profile description: Azteco profile is flat.
  - i. Texture: Heavy (deeply) embossed.
  - j. Gauge: [24] [22].
- k. Exterior Paint Finish Color:
  - 1) [Selected from current Panel Built Insulated Panels color chart] [Custom color as selected by Architect] [Color indicated].
  - 2) Finish System:
    - a) [1.0 mil. Silicone Modified Polyester finish.]
    - b) [1.0 mil. Fluoropolymer (PVDF) Two Coat system: 0.2 mil primer with 0.8 mil Kynar 500 (70%) SOLID color coat.]
    - c) [1.0 mil. Fluoropolymer (PVDF) Two Coat system: 0.2 mil primer with 0.8 mil Kynar 500 (70%) MICA color coat.]
    - e) [2.4 mil. Fluoropolymer (PVDF) Three Coat system: 0.8 mil primer with 0.8 mil Kynar 500 (70%) SOLID color coat and 0.8 mil clear coat.]



**E. Exterior Aggregate Finish:**

- 1) Baked epoxy primer with factory applied [12 mil dry film thickness] [36 mil dry film thickness] finish coat of acrylic bonder and silica aggregate.
  - a) Silica Aggregate Color: [Selected from current Panel Built Insulated Panels GRANITSTONE color chart] [Custom color as selected by Architect] [Color indicated].
  - b) Quartz Aggregate Color: [Selected from current Panel Built Insulated Panels GRANITSTONE QUARTZ color chart] [Color indicated].
7. Interior Face of Panel:
- a. Material:
    - 1) Steel coil material shall be [Grade 33, G90 galvanized steel in accordance with ASTM A653 and A924] [AZ50 Galvalume®/ Zinalume® (55% aluminum, 45% zinc) in accordance with ASTM A792].
  - b. Profile: Shadowline.
  - c. Texture: [Non-directional stucco embossed] [Smooth].
  - d. Gauge: [26] [24].
  - e. Interior Finish: [modified polyester, dry film thickness of 1.0 mil including primer.] [PVDF finish, dry film thickness of 1.0 mil including primer] [Vinyl Plastisol, 4.0 mil including primer].

**Product Specifications**

Panel Thickness	6"
R-Value	3.6 per inch
Panel Width	42"
Lengths	6' to 40'
Joint Configuration	Double tongue and groove interlocking rainscreen joint with a hidden fastner
Reveals	Standard 1/8" vertical and horizontal application
Exterior Face	24 ga. Shawdowline, Micro-Rib or V-Groove profiled embossed G-90 galva- nized or Galvalume pre-painted steel
Interior Face	24 ga. Shawdowline profiled embossed G-90 galvanized or Galvalume pre- painted metal
Insulation Core	Mineral Wool