



# TechPanel®

## 3-in-1 MgO Structural Assembly



ESR - 5346  
Report



**MANUFACTURED IN  
NORTH AMERICA**

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## 3-in-1 MgO Structural Assembly Prefab Structurally Insulated Panel

As part of the building envelope, TechPanel® provides a 3-in-1 manufactured solution: framing for structural stability, insulation for minimal thermal bridging and airtightness, and MgO cement sheathing for assembly integrity and climate resilience.

By prefabricating wall, floor, and roof panels in a controlled environment, we can significantly reduce onsite labor, minimize material waste, and enhance overall project efficiency.

### The Benefits

- Significantly decreases the time to enclose the building
- Contributes to a high-performance, energy-efficient building envelope
- TechPanel® eliminates voids and reduces thermal bridging that can otherwise cause condensation, potentially fostering harmful mold, mildew, or rot

### The Applications

- Structural support for Type II, III, IV and V construction
- Mold and moisture protection in high humidity areas
- Meeting stringent building codes as it applies to evolving fire resistance, sustainability and permitting requirements

### TechPanel® Designed For:

- Fire-Rated Assemblies
- Structural Walls (Interior and Exterior)
- Roofing Applications
- Structural Floor Applications
- Foundation Walls

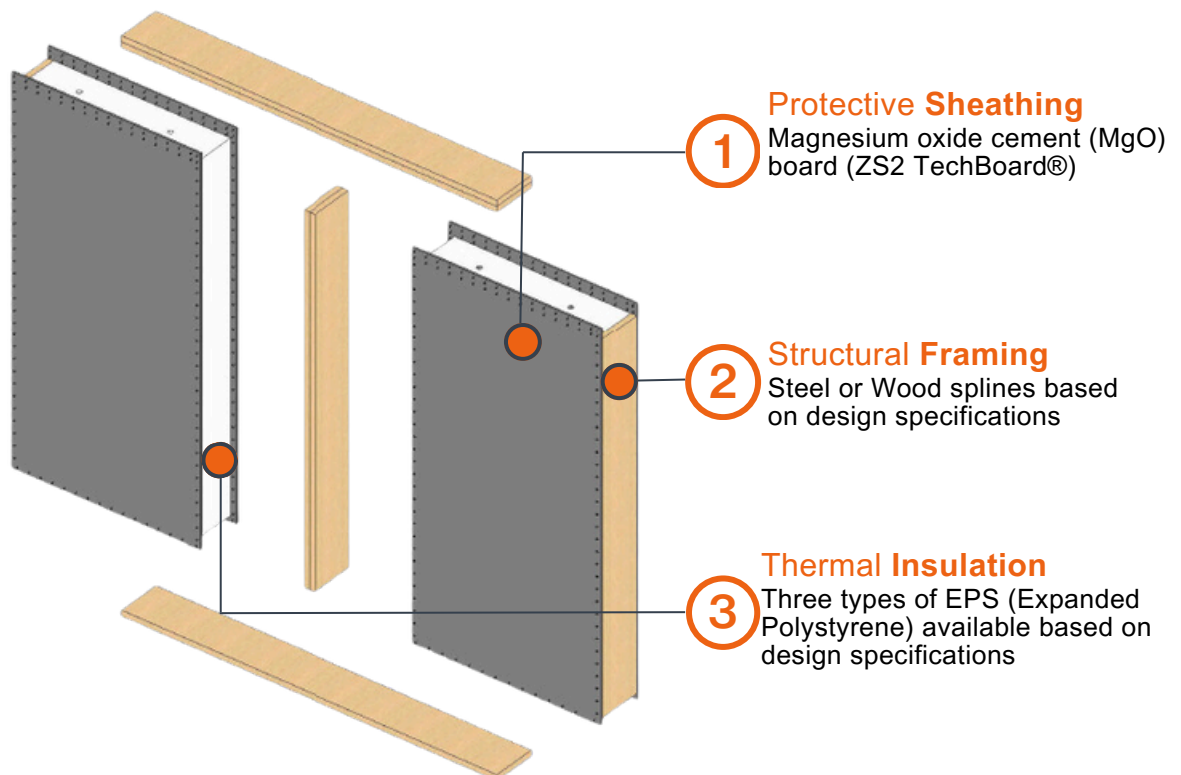
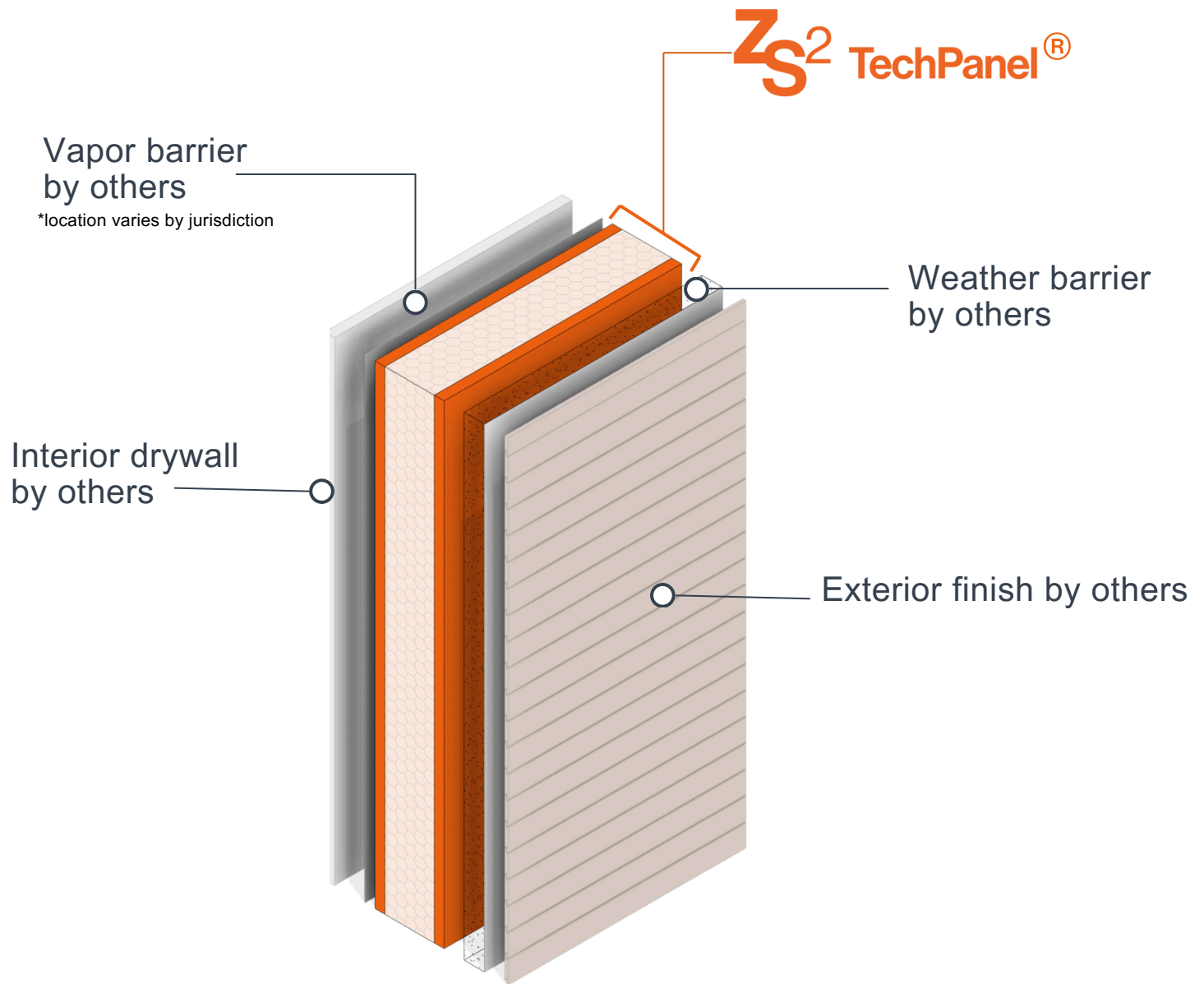


Fig. 1.1 TechPanel® Assembly

## Building with TechPanel®

TechPanel® streamlines a high-performance building envelope by combining structure, insulation, and sheathing into a single, prefabricated assembly. Unlike traditional construction, which separates these layers, this assembly offers consistent thermal performance, reduces air leakage, and minimizes thermal bridging. This integrated approach enhances energy efficiency, accelerates construction, and ensures a more durable, sustainable building envelope.



*Fig. 1.2 Building Envelope Assembly*



# TechPanel® Advantages

## Material Properties

Leading MgO cement technology to safeguard your investment



MgO  
Technology



Fire  
Resistant



Water  
Resistant



Mold  
Resistant



Humidity  
Control



Pest  
Resistant



## Onsite Benefits

Where the benefits of offsite construction meet onsite efficiency.



Less  
Waste



Quality  
Control



Reduced  
Schedule



Reduced  
Labor



Cost  
Certainty



Optimized  
Offload

ZS2 TechPanel® have undergone a full lifecycle assessment in accordance with ISO 21930:2017 and are certified under [EPD #SCS-EPD-08294](#), providing third-party verified environmental performance data.

## Sustained Value

Long term support



Sustained  
Structural Integrity



Climate  
Resilient

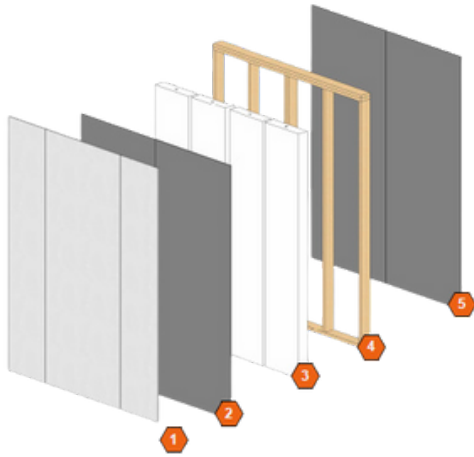


Reduced  
Operational Costs



Sustainable  
Material

# TechPanel® | Fire-Rated Assemblies



**1 HR**

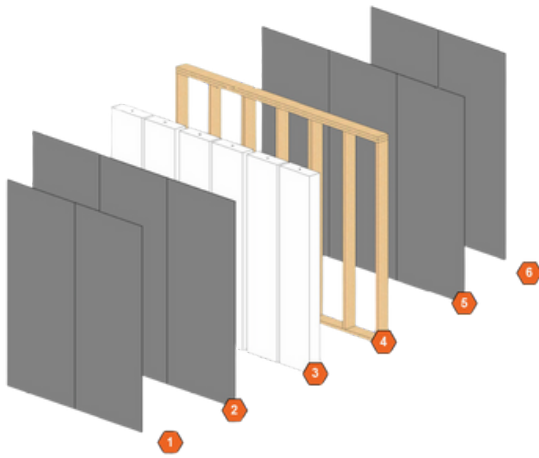
## Fire-Rated

ASTM E119  
CAN/ULC S101

**TechPanel® | 7 1/2"**  
**Load-Bearing Assembly**  
**FRL-60**

### Key

1. 5/8" (16mm) Type X Gypsum Wall Board complying with ASTM C1396 (Interior Side A)
2. Techboard™ 1/2" (13 mm) thickness
3. 5 1/2" EPS, Type I specifications of ASTM C578
4. Wood Framing 24" o.c (min)
5. Techboard™ 1/2" (13 mm) thickness



**2 HR**

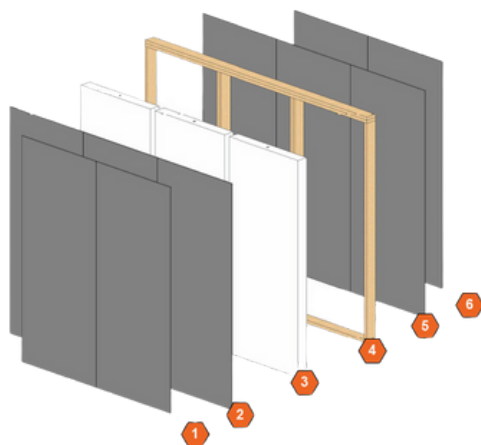
## Fire-Rated

ASTM E119  
CAN/ULC S101

**TechPanel® | 9 1/4"**  
**Load-Bearing Assembly**  
**FRL-120**

### Key

1. Techboard™ 1/2" (13 mm) thickness
2. Techboard™ 1/2" (13 mm) thickness
3. 7 1/4" EPS, Type I specifications of ASTM C578
4. Wood Framing 24" o.c (min)
5. Techboard™ 1/2" (13 mm) thickness
6. Techboard™ 1/2" (13 mm) thickness



**2 HR**

## Fire-Rated

ASTM E119  
CAN/ULC S101

**TechPanel® | 7 1/2"**  
**Non-Load Bearing Assembly**  
**FRL-120**

### Key

1. Techboard™ 1/2" (13 mm) thickness
2. Techboard™ 1/2" (13 mm) thickness
3. 5 1/2" EPS, Type I specifications of ASTM C578
4. Wood Framing 48" o.c
5. Techboard™ 1/2" (13 mm) thickness
6. Techboard™ 1/2" (13 mm) thickness

ZS2 TechPanel® may be used in specific published fire-resistant-rated assemblies as tested in accordance with ASTM E119 and CAN/ULC S101. Follow published fire-resistance rated requirements and consult local building codes and designer of record for fire-resistant design requirements.

### Have a project in mind? Get in touch.

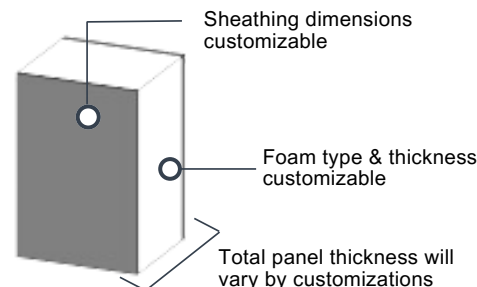
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## Manufactured to Specification

ZS2 manufactures TechPanel® to spec from the individual requirements of your architectural, electrical, and mechanical drawings.

Sheathing options, insulation options, and standard dimensions and thicknesses of panel assemblies are listed in the charts below for reference.



## Sheathing Options

ZS2 TechPanel® exclusively utilizes ZS2 TechBoard® for its sheathing. ZS2 TechBoard® is a cementitious magnesium oxide (MgO) board, reinforced with fiberglass mesh layers and made using ZS2’s proprietary MgO cement technology. The board thickness can be customized based on the specific needs of your project, allowing for optimized panel strength and performance based on application requirements.

Nominal Product Thickness	Edge Profile	Standard Sizes	Weight Per Board*	R-Value per inch
1/2"	Square	4' x 8' (1219 mm x 2438 mm)	80 lbs	1
1/2"	Square	4' x 9' (1219 mm x 2750 mm)	90 lbs	1
1/2"	Square	4' x 10' (1219 mm x 3050 mm)	100 lbs	1

\*Average board weight may vary

\*R-Value information provided to be used as a reference only

## Insulation Options

TechPanel® offers three insulation options to suit various building needs. Expanded Polystyrene (EPS) is a closed-cell foam that provides effective thermal insulation and moisture resistance. Type 1 EPS is lighter with lower density, while Type 2 EPS offers greater (R-Value) compressive strength and durability. Graphite EPS further boosts energy efficiency by reduces radiation heat transfer resulting in higher thermal resistance (R-value). The choice between these materials depends on project requirements such as durability, insulation performance, and structural load.

Material Property	Test Method	Type I EPS	Type II EPS	Graphite EPS
Thermal Resistance Minimum RSI per 25mm (R per inch)	ASTM C518	0.65 m <sup>2</sup> • 0C/W (3.75 ft <sup>2</sup> •h•0F/BTU)	0.70 m <sup>2</sup> • 0C/W (4.04 ft <sup>2</sup> •h•0F/BTU)	0.82 m <sup>2</sup> • 0C/W (4.7 ft <sup>2</sup> •h•0F/BTU)
Compressive Resistance	ASTM D1621	70 kPa (10 psi)	140 kPa (20 psi)	70 kPa (10 psi)
Flexural Strength	ASTM C203	170 kPa (25psi)	280 kPa (40psi)	170 kPa (25psi)
Water Vapour Permeance	ASTM E96	300 ng/(Pa.s.m <sup>2</sup> ) (5.0 Perms)	200 ng/(Pa.s.m <sup>2</sup> ) (3.5 Perms)	300 ng/(Pa.s.m <sup>2</sup> ) (5.2 Perms)

\*Increasing EPS density will enable a reduction in overall panel thickness while maintaining high energy efficiency

\*A Certified Energy Consultant should perform project-specific calculations



**ICC-ES Evaluated**  
**ESR-5346**



**EPD #SCS-EPD-08294**  
Compliant with ISO 21930:2017  
Sustainability in buildings and  
civil engineering works



**CERUS-1009**  
Meets  
Requirements

## Have a project in mind? Get in touch.

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## Common Assemblies

Total Panel Thickness	Sheathing Thickness	Insulation Thickness	Size	Avg Weight
6.5"	1/2"	5.5"	4' x 8' (1219 mm x 2438 mm) 4' x 9' (1219 mm x 2750 mm) 4' x 10' (1219 mm x 3050 mm)	6.25 psf
8.25"	1/2"	7.25"		6.75 psf
10.25"	1/2"	9.25"		7.25 psf
12.25"	1/2"	11.25"		7.75 psf

\*Information provided to be used as a reference only  
\*Average panel weight may vary

Property	Method	Value	MAX Supporting Spacing	Edge / Field Spacing	Code Evaluation Report
Flame Spread / Smoke Development Index (TechBoard®)	ASTM E84	0 / 0			<a href="#">CERUS-1009</a>  <a href="#">ESR-5346</a>
Fire Resistance (TechBoard®)	CAN/ULC S135	PASS			
	NFPA 286	PASS			
Mold & Mildew (TechBoard®)	ASTM C1138	PASS			
Vapour Permeance (TechBoard® 1/2")	ASTM E96 (Procedure A)	2.2 US Perms (125.02 ng/Pa·s·m²)			
Racking Shear (Aspect Ratio / Load) (6.5" TechPanel® Assembly*)	ASTM E72	2:1 / 562 lbf 1.25:1 / 607 lbf 1:1 / 501 lbf**	10 ft height	2.5" ring shank nail @ 3" o.c / 12" o.c	
Transverse (6.5" TechPanel® Assembly*)	ASTM E72	See below	4'	2.5" ring shank nail @ 3" o.c / 12" o.c	
Axial (6.5" TechPanel® Assembly*)	ASTM E72	3586 lbs/ft	4'	2.5" ring shank nail @ 3" o.c / 12" o.c	
	ASTM E72	4270 lbs/ ft**	4'	2.5" ring shank nail @ 3" o.c / 12" o.c	
Vapour Permeance (6.5" TechPanel® Assembly*)	ASTM E96 (Procedure A)	0.3 US Perms (16.81 ng/Pa·s·m²)			
Fire Resistance (6.5" TechPanel® Assembly*)	ASTM E119	1 hr***			
	CAN/ULC S101	2 hr***			
Wind Load (6.5" TechPanel® Assembly*)	TAS 201	Large Missile Pass (Hurricane Testing)			
	TAS 202	110 psf	4'	2.5" ring shank nail @ 6" o.c / 12" o.c	
	TAS 203	110 psf	4'	2.5" ring shank nail @ 6" o.c / 12" o.c	
Sound Transmission Coefficient (6.5" TechPanel® Assembly*)	ASTM E90	26	4'	2.5" ring shank nail @ 6" o.c / 12" o.c	

\*Values for standard 6.5" x 4' x 10" TechPanel® assembly with Type I 5.5" EPS insulation

\*\*Values for 6.5" x 4' x 8' panel assembly

\*\*\*Assembly requirements detailed on fire-rated assembly's page. Consult ZS2 for further details.

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## HVHZ | High Velocity Hurricane Zones

ZS2 TechPanel® has been approved for use including applications including areas prone to wind-born debris (high-velocity hurricane zones). The TechPanel® assembly\* has been tested successfully in accordance with the testing standards and requirements for a maximum design pressure of 110 PSF.

Method	Value	Florida Product Number
ASTM D1929	PASS	<a href="#"><u>FL44609</u></a>
ASTM E84	PASS	
NFPA 286	PASS	
TAS 201	PASS	
TAS 202	PASS	
TAS 203	PASS	

\*Concurrent with the ZS2 installation manual and installation drawing requirements, all TechPanel® projects require a full structural engineered design to accommodate design loads in accordance with the 2023 Florida Building code for the use in High Velocity Hurricane Zones (HVHZ). Load charts for axial, racking shear, and transverse loading have been produced based on third-party testing. All load charts are also third-party engineer reviewed and are available for design use.

## Deflection Properties | Wall Panels

Property	Method	Span	Stud Thickness	Value
L / 360 (psf)	ICC-ES A04	120"	2" x 6" spf	65
L / 240 (psf)	ICC-ES A04	120"	2" x 6" spf	82
L / 180 (psf)	ICC-ES A04	120"	2" x 6" spf	82

## Deflection Properties | Floor Panels

Property	Method	Span	Stud Thickness	Value
L / 360 (psf)	ASTM E72	120"	2" x 6" spf	51
L / 240 (psf)	ASTM E72	120"	2" x 6" spf	78
L / 180 (psf)	ASTM E72	120"	2" x 6" spf	101

\*Applicable only when the TechPanel® is in direct ground contact with piles, piers, or beams.

## Deflection Properties | Roof Panels

Property	Method	Span	Stud Thickness	Value
L / 360 (psf)	ICC-ES A04	120"	2" x 6" spf	51
L / 240 (psf)	ICC-ES A04	120"	2" x 6" spf	48
L / 180 (psf)	ICC-ES A04	120"	2" x 6" spf	101

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## Testing Standards

- **ASTM C518** - Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus.
- **ASTM D1621** - Standard Test Method for Compressive Properties of Rigid Cellular Plastics.
- **ASTM C203** - Standard Test Methods for Breaking Load and Flexural Properties of Block-Type Thermal Insulation.
- **ASTM E96** - Standard Test Methods for Water Vapor Transmission of Materials.
- **ASTM E84** - Standard Test Method for Surface Burning Characteristics of Building Materials.
- **CAN/ULC S135** - Standard Test Method for the Determination of Combustibility Parameters of Building Materials Using an Oxygen Consumption Calorimeter (Cone Calorimeter).
- **NFPA 286** - Standard Methods of Fire Tests for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth.
- **ASTM C1138** - Standard Test Method for Abrasion Resistance of Concrete (Underwater Method).
- **ASTM E72** - Standard Test Methods of Conducting Strength Tests of Panels for Building Construction.
- **ASTM E96 (Procedure A)** - Standard Test Methods for Water Vapor Transmission of Materials - Procedure A.
- **ASTM E119** - Standard Test Methods for Fire Tests of Building Construction and Materials.
- **CAN/ULC-S101** - Standard Test Methods for Fire Endurance Tests of Building Construction and Materials.
- **TAS 201** - Impact Test Procedures (Hurricane Testing).
- **TAS 202** - Criteria for Testing Impact & Non-Impact Resistant Building Envelope Components Using Uniform Static Air Pressure.
- **TAS 203** - Criteria for Testing Products Subject to Cyclic Wind Pressure Loading.
- **ASTM E90** - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements.
- **ASTM D1929** - Standard Test Method for Determining Ignition Temperature of Plastics.
- **ICC-ES A04** - Acceptance Criteria for Sandwich Panels.

## Handling & Use

All materials should be delivered and stored in their original unopened package and stored in an enclosed shelter providing protection from damage and exposure to the elements.

Please refer to ZS2 Install Drawings, Specifications and Instructions for installation of your individual project.

Visit [zs2technologies.com/construction-solutions/techpanel/#technical-documents](https://zs2technologies.com/construction-solutions/techpanel/#technical-documents) or contact a ZS2 representative for more details.

## Fastening

Mechanical fastener: Cement board screws, stainless steel staples, stainless-steel wood screws, or coated wood screws with a minimum salt spray coating of 800 should be used. Proper spacing and installation methods should be followed to avoid damaging the sheathing.

## Finishing

All interior and exterior finishes must be approved by the local building authority with jurisdiction. ZS2 defers to traditional finishing methods, ensuring that all internal and external finishes comply with local building codes. Standard industry practices should be followed, integrating appropriate supplementary materials as required by conventional construction methods and specific project needs. Refer to project architect, or envelop engineer for specifications of exterior finishes.

## Warranty

10 Year Limited – Prorated – Nontransferable Warranty.

Visit [www.zs2technologies.com/warranty](http://www.zs2technologies.com/warranty) or contact a ZS2 representative for details.

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