

**It's A Virtual Air Barrier
by Pressurization of the Enclosure
& we Achieve UnExpected Results**
FIGURE 9B



PortalWall® Technical White Paper - Version 1.0

At the Intersection of Energy Code Compliance & Condensation Management

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Executive Summary

This paper introduces the PortalWall® family of building enclosure systems, developed in response to escalating energy code demands and unresolved condensation risk. By managing both thermal absorption and controlled airflow, this platform solves long-standing performance and durability challenges in facade systems. PortalWall® integrates structural, thermal, vapor, and fire control into a factory-scalable solution, simplifying design while addressing critical moisture management failures seen across the built environment.

Problem Statement: Energy Efficiency and Condensation Risk

Aggressive energy efficiency mandates have forced building envelopes to become increasingly insulated and air-tight. While these measures reduce energy losses, they inadvertently introduce high condensation risks when vapor cannot escape and thermal bridges are poorly managed. Industry



guidance often fails to address the practical assembly challenges faced in the field, leaving projects vulnerable to long-term performance failures including mold propagation and material degradation.

The Governing Principle: Control Air Movement & Surface Temperatures

At the core of the entire system family is one unifying principle: control air movement and surface temperatures to eliminate condensation risk, stabilize performance, and simplify long-term envelope durability.

Active-Wall™ (Infill Zones)

- Apertures or portals to promote air movement.
- Pressurized or Passive air flow stabilizes surfaces and evacuates moisture.
- Reduces condensation even in highly insulated opaque assemblies.

PortalWall® (Spandrel Zones)

- No air flow allowed — must serve as a hard stop for fire, smoke, vapor, and air.
- Metal diaphragm absorbs heat & maintains surface temperatures above the dew point.
- Prevents condensation, reduces mold risk.

Without this air/thermal control logic, condensation cannot be fully managed. This separates these systems from conventional assemblies.





PortalWall® — The System

- Fully integrated enclosure system.
- Drop-in replacement for stick-built curtainwall, unitized systems, rain-screens, and framed stud walls.
- Combines structure, thermal control, vapor management, fire separation, air control, and simplified installation.
- Factory-controlled, repeatable, scalable, and fast to install.

The Water Draining Spandrel Assembly — The Core of PortalWall®

- Structural Load Transfer: Metal diaphragm connects head to sub-sill, eliminating vertical mullions.
- Thermal Stability: Maintains interior surface temperatures above dew point.
- Vapor and Air Control: Impermeable to air and vapor, eliminating field-applied barriers.
- Fire & Smoke Separation: Full fire and smoke barrier at floor lines.
- Factory Controlled Fabrication & Installation: Fully assembled sections delivered and installed with minimal labor.

System Family Deployment Roadmap

Active-Wall™ (Infill Zones): READY TO ENGINEER AND DEPLOY

- Design engineering complete using off-the-shelf repurposed materials.

PortalWall® (Spandrel Zones): DEPLOYMENT-READY TODAY

- Core aluminum shapes available. Third generation design finalized with





Keymark as extrusion partner.

Kingspan as Vacuum Insulated Panel supplier & QUADCORE

DelugeWall™ (Next Development Phase): UNDER DEVELOPMENT – PATENTS
PENDING

- Active surface cooling system reduces HVAC loads, adds fire management capabilities, and targets high-load climates.

Why This is First-of-its-Kind

- Integrated structure, thermal stability, vapor control, condensation management, fire separation, and factory scalability.
- Resolves longstanding failures.
- Simplifies fragmented market into one family of assemblies.
- Adaptive to future code and climate demands.
- Reduces materials, layers, components, and fabrication steps.

How We Monetize

- Licensing, engineering fees, controlled procurement, and strategic partnerships.
- Recurring revenue via evolving platform.
- Direct licensing to municipalities for public procurement.

**Foundational Design - Global Rollout Can Be Achieved
Working with B-FLUID's Cristina Paduano**

Deployment Readiness

- Engineered and validated system family.
- Extrusions and materials available.





- Fabrication protocols established with qualified fabricators.
- Active customer discussions conditioned on controlled deployment.

Intellectual Property Position

- Governed by active patent portfolio controlled by inventor.
- Multiple patents filed covering system logic, assembly design, thermal management, vapor control, and manufacturing.
- Additional patents cover specific innovations for PortalWall®, Active-Wall™, and DelugeWall™.
- Several filings pending ensuring defensibility and long-term control.

“The customers are ready to buy, they said so.” — Yonatan Zvi Margalit

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