

The logo for ATi, featuring the letters 'A', 'T', and 'i' in a blue, three-dimensional sans-serif font. The 'A' and 'T' are uppercase, and the 'i' is lowercase. The letters have a slight shadow effect, giving them a 3D appearance.

ATi

NexSys[®]
Nano-Crystalline
Composites
Technology

Non-Combustible Fire Rated
Precast Wall Assemblies

ATi Composites Canada Inc.

4704-91 Avenue
Edmonton, AB
T6B 2L1
Ph: 780-231-4793

The benefits of pre-cast concrete
at 1/4 of the weight

Mike Mabey
President & Chief Technology Officer
780.231.4793, aptd1@shaw.ca

©2020

US Patents 10,364,185 & CDN Patents Pending

New Product & N.A. Business Opportunity

The North American building codes are undergoing substantial changes in terms of the **TRUE R-Value of building envelopes**, while maintaining or improving the fire resistance ratings of many multi-family or commercial structures to facilitate ever-higher population densities.

OVERVIEW: Recent improvements in nano-composite technologies have lead to the development of a **composite wall assembly** that offers a number of unique functional advantages:

Technology Overview:

- Multiple market opportunities from curtain walls and exit stairwells to elevator shaft wall applications,
- Lighter weight – roughly 1/4 the weight of a concrete block wall (with an R-3 rating),
- Composite Wall Assembly with a True R-30 rating, at less than an 8 Inch thickness.
- Nano-Composite Mineral Foam Core provides exceptional Fire Resistance
2 to 4 hours (ASTM-E119 - ULC/Can4-S101)
- UL Listings for supports in a proprietary glass curtain wall (60, 90 & 120 Minutes),
- US and Canadian patents issued and pending,
- Much improved STC ratings when compared to 'conventional' assemblies.
- Excellent margins and competitive pricing compared to other comparable systems.
- Precast 'tilt-up' wall assemblies installed in minutes,
- All materials and components are readily available across North America,
- Substantial interest from several of the largest commercial construction companies in North America **for use of the RTU (finished) products** in their high rise projects.

Regional or National Technology Transfer and Licensing Opportunities are available.

For more information, please contact:
Mr. Michael Mabey, Inventor & CEO
ATI-Composites Canada Inc.
(780) 231-4793
www.ati-composites.net

INTRODUCTION:

The NexSys Fire Wall & Partition System represents a breakthrough in commercial and multi-family construction.

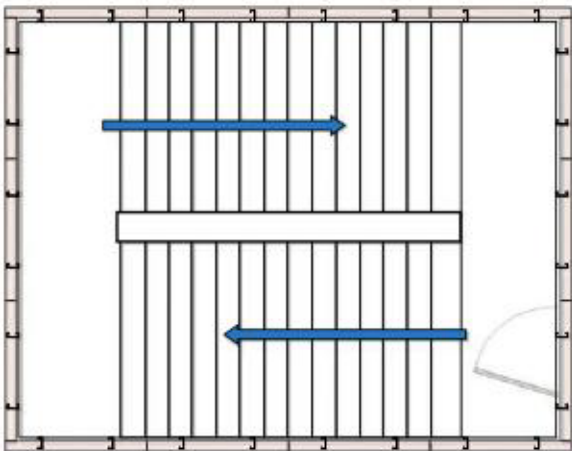
- 1) **Structural Wall Panels:** Uses a patented assembly of unique materials including light gauge, open web, galvanized steel studs and a ATI's NanoComposite Mineral Foam technology.
- 2) **UL-Listed, Fire Rated Assemblies:** These precast wall panels can provide Fire Resistance Ratings under ASTM-E119 or Can4-S101 that go from 1 to 4 hours.
- 3) **Light weight assemblies:** Provides ease of shipping and handling, connection details are built right into panels for ease of installation.
- 4) **TIME AND MONEY SAVINGS:** When compared to concrete block, or other methods, these panels can save thousands of dollars in real & opportunity costs – when factors such as scheduling delays (skilled labour shortages), weather delays, scaffolding, heating & hoarding, and transportation costs are taken into account.
- 5) **Multi-faceted design:** These panels can be designed to accommodate a wide range of applications, wind load and other considerations – see the pages that follow for some of the potential configurations.
- 6) **Prefinished Exteriors:** One design shows how these panels can be prefinished with an extremely tough exterior facing that can be withstand both abrasion or abuse during transportation and installation, but also provide an extremely hard (textured) face which mimics ceramics or polished stone for its surface features
- 7) **Relocatable:** Wall sections can be designed to be moved (or be movable) as leased buildings are re-demised to accommodate new tenants over time.
- 8) **Any size, any thickness:** These panels can be as thin as a standard 2 X 4 wall for interior partitions, to more than 8 inches thick for an exterior or demising wall with up to 4 hours of fire resistance – fire separations.
- 9) **Sound Dampening:** The lightweight mineral foam core offers exceptional sound dampening to the wall assembly.

Stairwell / Elevator Shaft Wall Assembly

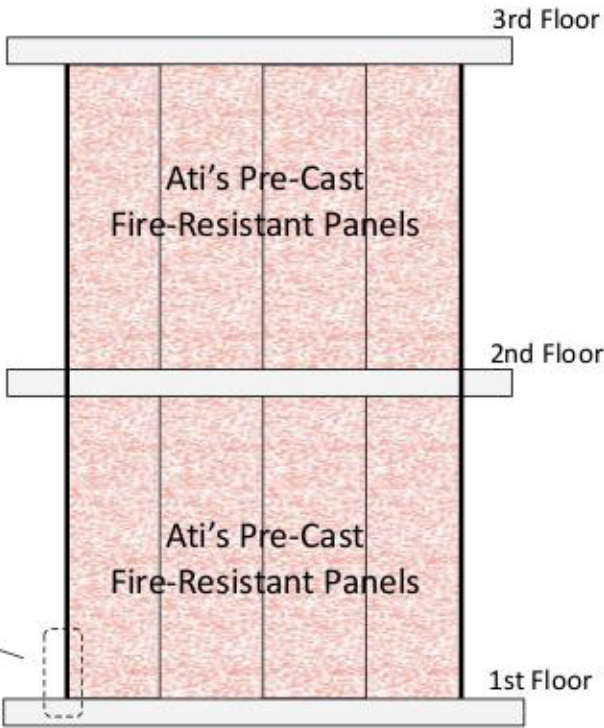
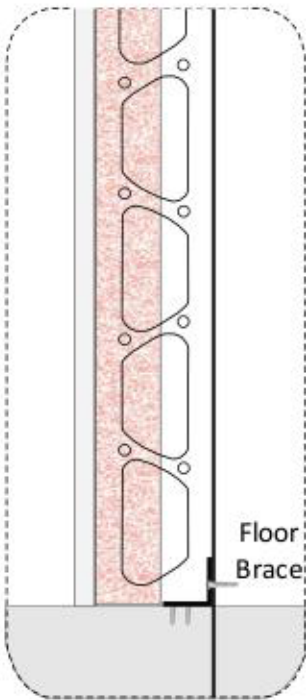
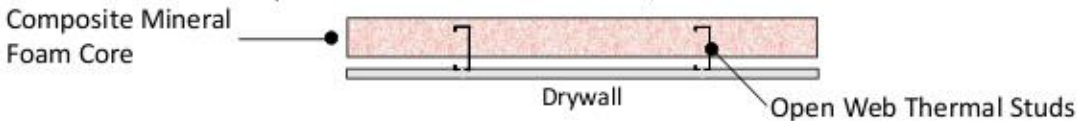
Tilt-into-place
2-Hour Fire Resistant,
acoustic dampening,
**stairwell/elevator
shaft wall system.**

- Labour saving
- Lightweight
- Economical
- Pre-cast for rapid installation
- 2-4 Hour Fire Resistance Rating

Top View of Panel Sections around Stairwell



Top View of Panel Section c/w Mineral Foam Core

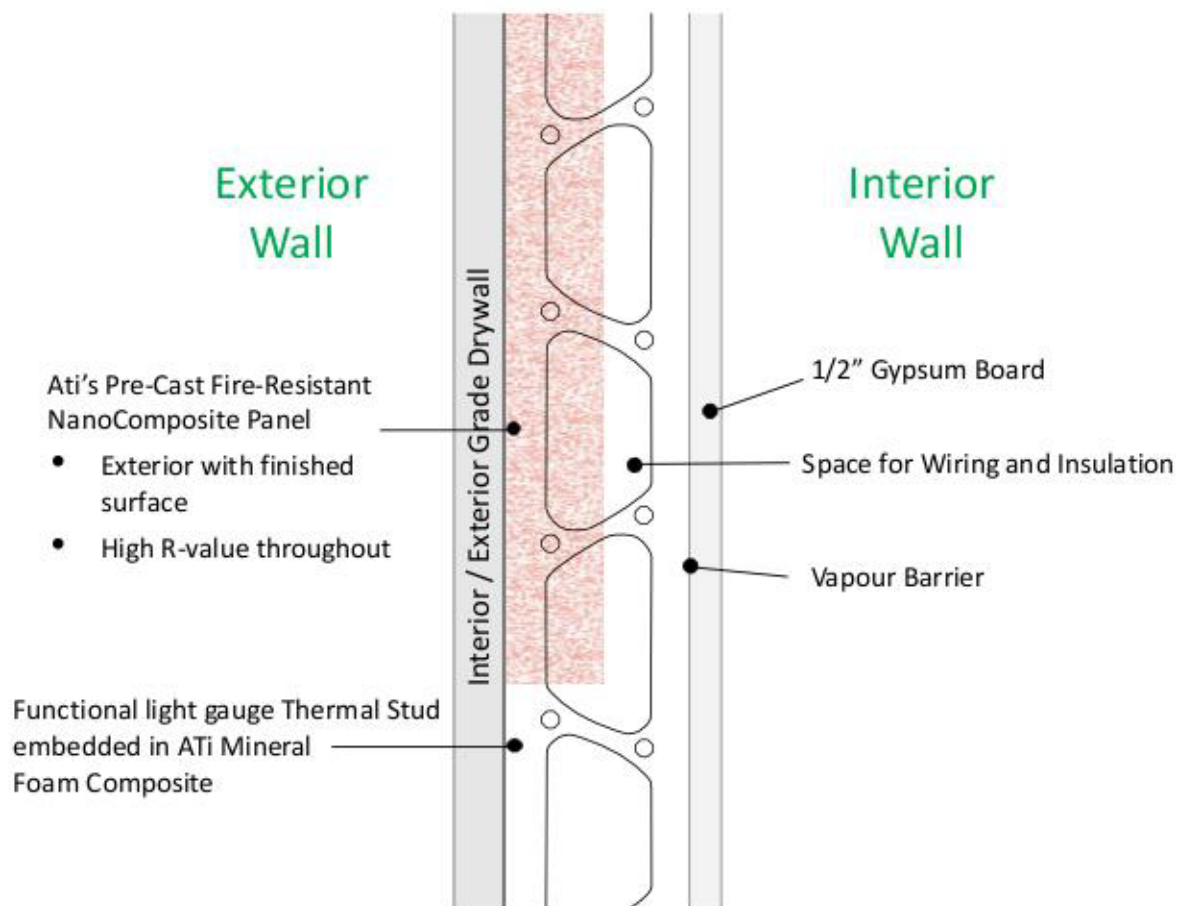


(Patents Pending)

Curtain Wall Assembly - Interior/ Exterior

Tilt-into-place curtain wall system interior or exterior wall and 2+ Hours Fire Resistance Rating.

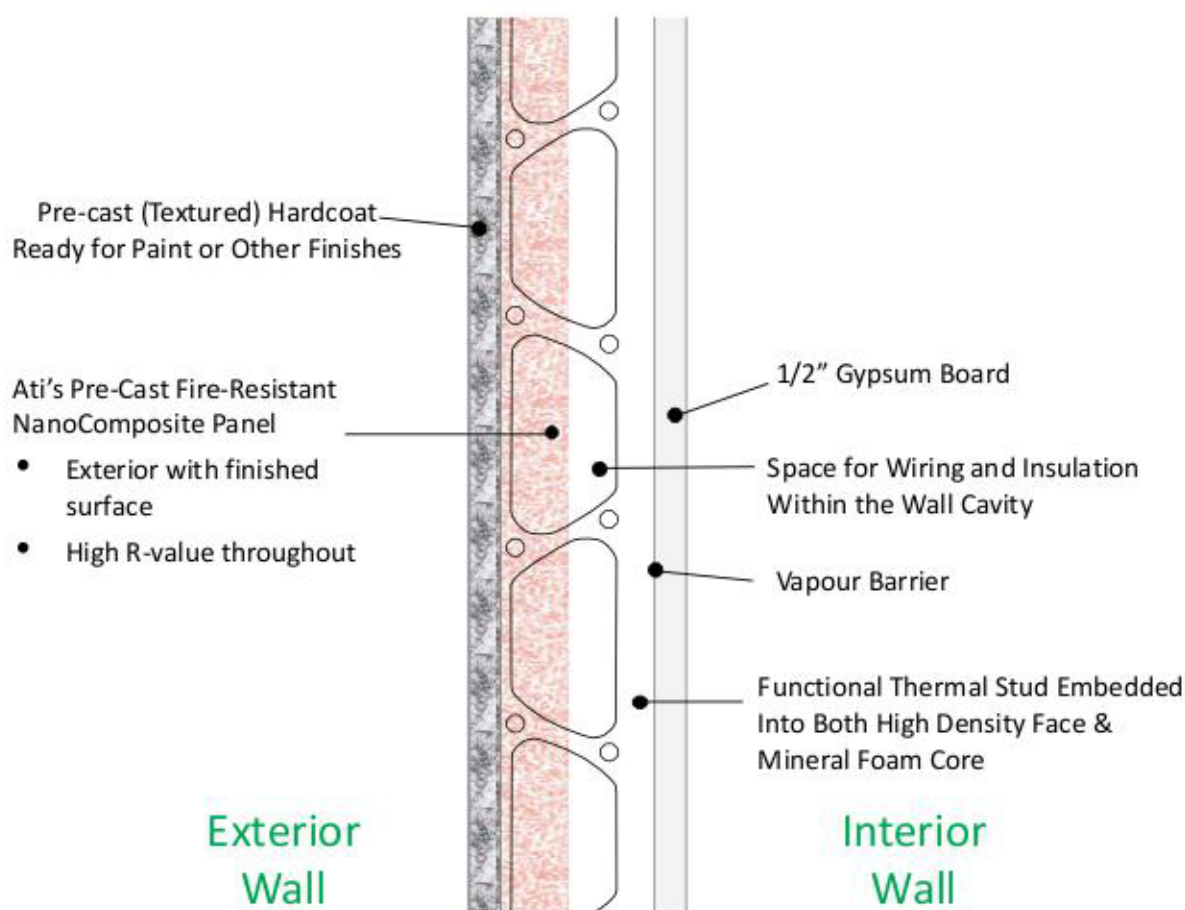
- Space for wiring, plumbing and extra insulation
- Functional exterior wall, ready for rain screen or other finishes
- Sound dampening
- Thermal stud available in a wide range of widths, gauges and load bearing capacity



Curtain Wall Assembly - Exterior - PreFinished

Tilt-into-place exterior curtain wall system with 2+ Hours Fire Rating.

- Space for wiring and extra insulation
- Functional exterior wall, optional architectural detail or texture on the exterior face
- Sound dampening
- Thermal stud available in a wide range of widths, gauges and wind/load bearing capacities



“Very cost-effective alternative to concrete block construction”

Acoustic & Fire Separation Party Wall Assembly

Symmetrical, tilt-into-place acoustic deadening, fire resistant barrier and structural party wall system.

Functional

- Sound deadening barrier
- Up to 4 Hour Fire Rating, Non-combustible
- Smoke seal on all edges and sides
- Structural, high strength for improved wind-load and racking

Ready to Install Pre-cast wall

- Reduces job site labour cost and install time
- Can be installed in any season
- Save on materials and waste
- Can be installed in virtually any building - commercial, residential, institutional or industrial
- Permits symmetrical assembly for ease and flexibility of design
- Electrical services installed within the wall cavity, without compromising fire rating
- Room for sound dampening materials within the wall cavity

Lightweight assembly

- Easy to handle, ship and install by drywall trades

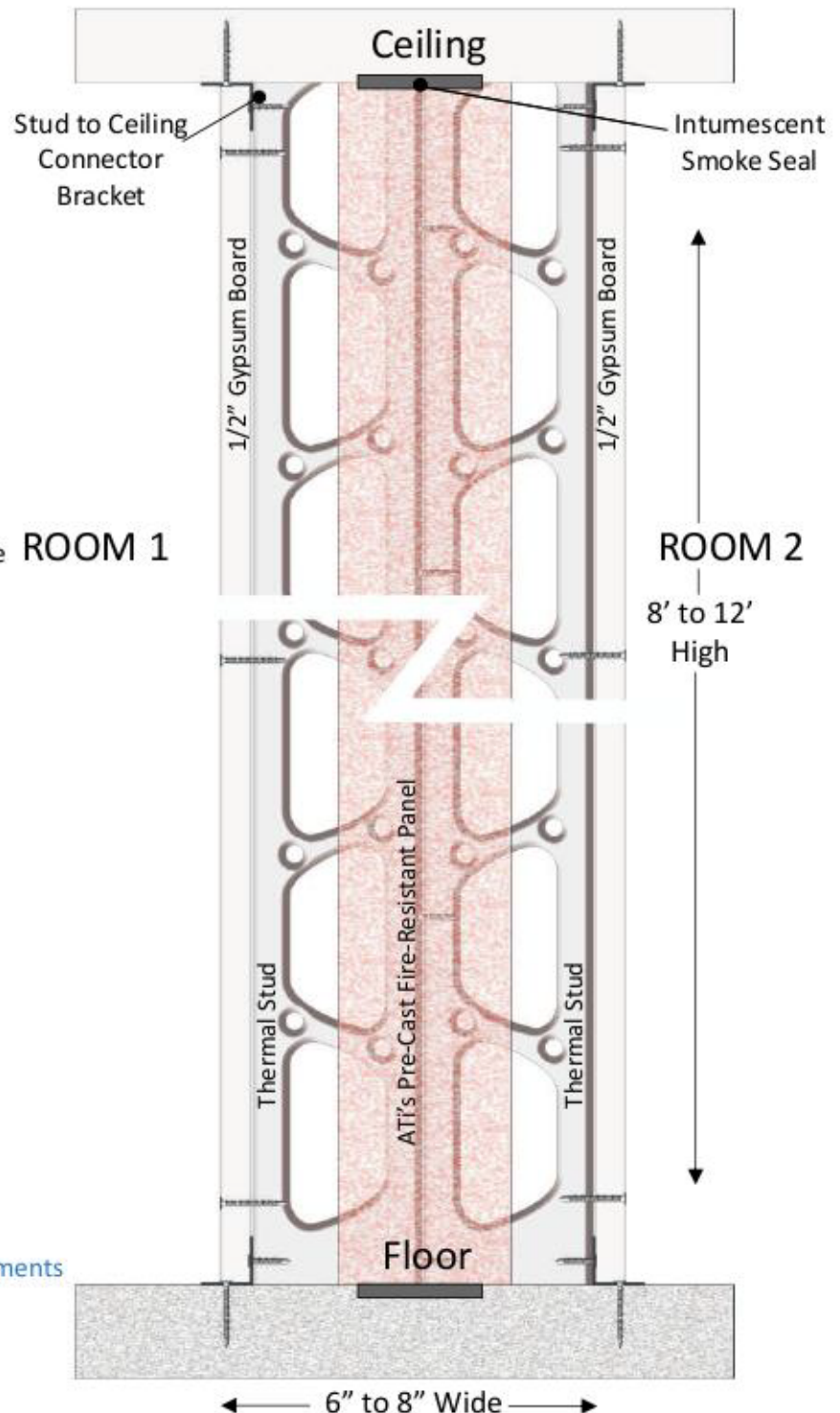
Plumbing and wiring in wall cavity

- No break of the fire and sound dampening membrane

Eco-friendly with hemp or flax fiber reinforcements

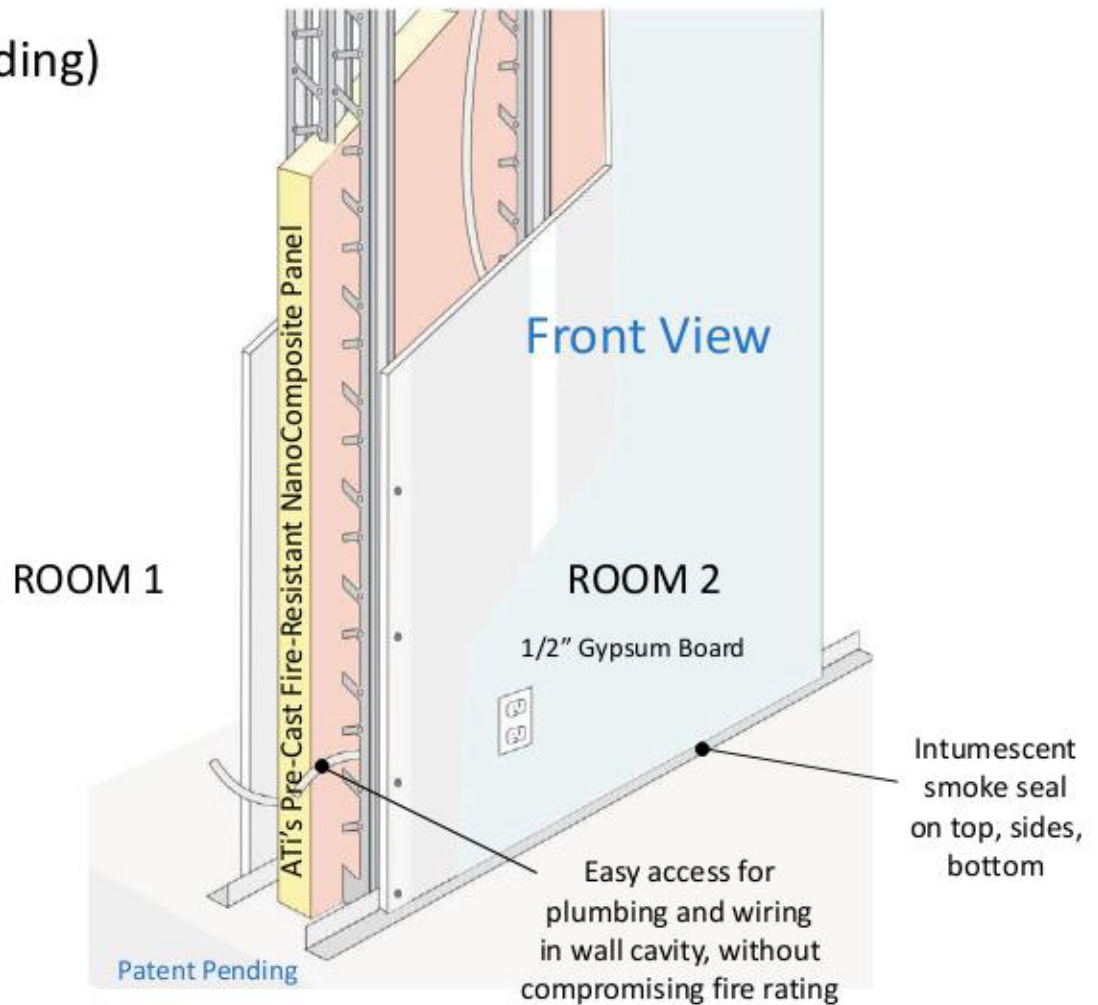
- LEED points
- Additional strength
- Cost effective alternative to concrete block construction

Side View

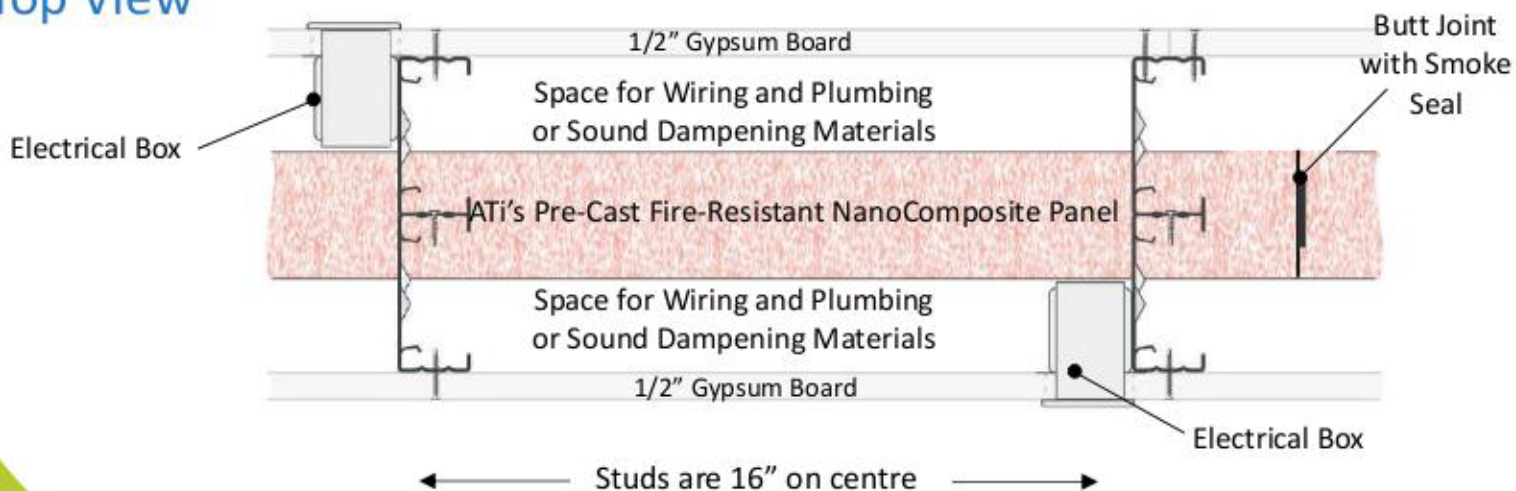


Acoustic & Fire Separation Party Wall Assembly

(Patents Pending)



Top View



ATI-Composites Canada Inc.

Fire Resistant Mineral Foam Composites

Technology Overview - How they work:

ATI-Composite Fire Resistant Mineral Foam would be classified as a decahydrate. In simple terms “deca” means ten and “hydrate” refers to chemically bound water. It is generally accepted that drywall (or gypsum board) is a fairly good fire resistant substrate and that 1 sheet of ½ drywall provides a 15-minute Thermal Barrier Fire Rating.

Drywall (gypsum board) provides fire protection by virtue of its chemistry, which is calcium sulfate dihydrate. Dihydrate refers to two moles of chemically bound water. At least one mole of this chemically bound water must be released from the matrix before the temperature on the cool face can exceed the 140C threshold stipulated in the ASTM-E119 / ULCCan4-S101 fire tests.

The ATI Composite provides substantially more water of hydration (or chemically bound water) than gypsum board. In this example ATI's decahydrate has up to 5 times more “water of hydration” than the gypsum board offers (though not all of the water is released during thermal decomposition).

When the ATI Mineral Foam is heated during a thermo-gravimetric analysis, it loses weight (water) gradually as it is heated from room temperature to 545C. In fact, the total weight loss (which is all water of hydration) is clearly **48 percent of its total weight**.

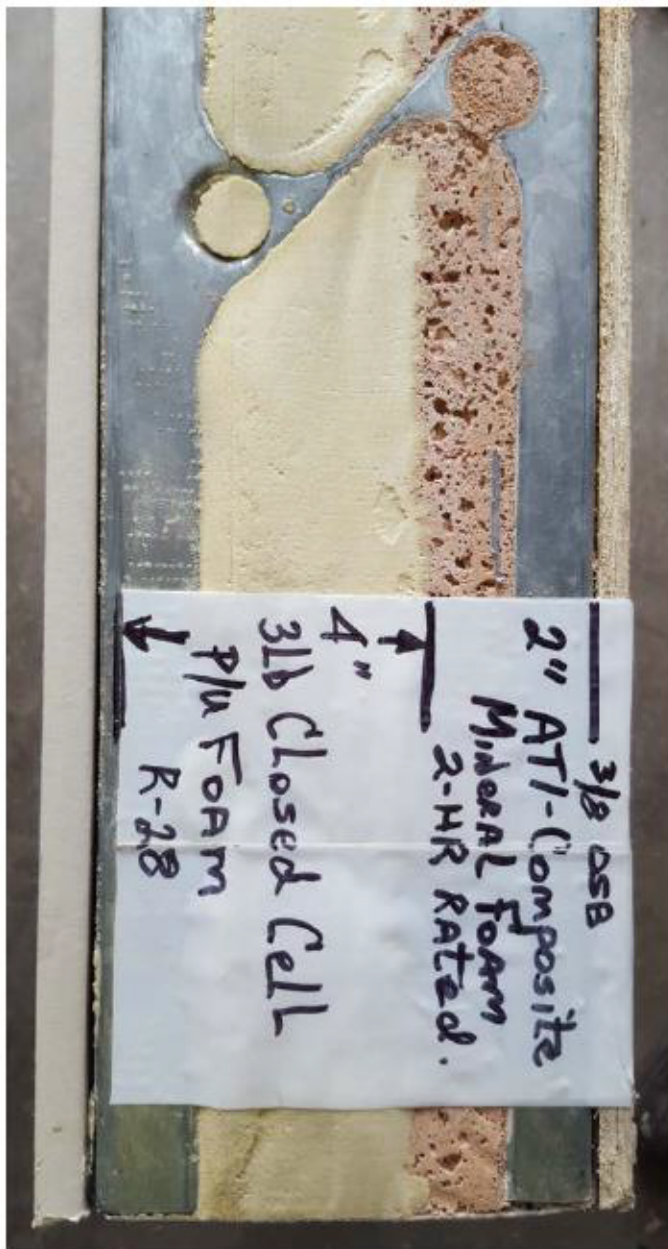
The process of releasing this chemically bound water of hydration uses very large amounts of heat energy, cooling the substrate and reduces the temperature rise through the material – in effect keeping the cold face below 110 C while the hot face in the typical fire test is heated to 1200+ degrees for up to 4 hours. The fire resistance of the panel or assembly is usually directly proportional to the thickness of the panel. Hence two sheets of drywall offers better fire performance than one sheet. A 1-inch thickness of ATi Mineral Foam is more effective than 1.5 or 2 inches of drywall. It can also be cast to fill or form any shape needed to meet the on-site installation requirements.

Recent side-by-side testing, at Warnock Hersey (Intertek) comparing the ATI Mineral foam to Certaineed Fyre Guard Gypsum or Donalco Spray Applied Fire Proofing at identical thickness show that the Mineral Foam out-performs these other materials by up to 400F over a one hour E119 / S101 Fire Test.

These side-by-side test results are available as a pdf bulletin on request.

Hybrid 2 to 3 Hour Fire Rated R-30, Precast Wall Panel System.

This close-up shows the unique combination of combustible OSB sheathing for ease of exterior finishing and then 2 inches of ATI-Composite Fire Rated Composite Mineral Foam insulated with 4 inches (R-28) closed cell P/U foam finished on the inside with 5/8" Type X 20 Minute - Fire Rated Drywall.



3/8" OSB
2" ATI-Composite
Mineral Foam
2-HR Rated.
4"
3lb Closed Cell
P/U Foam
R-28

Example No. 2 is a Trade Show exhibit of a similar structure but with a service cavity within the wall space which permits the installation of essential services such as plumbing or electrical **without compromising the Fire Resistance Rating** with perforating the drywall membrane which offer the fire protection in most Stud and Drywall Systems on the market today. The open web Light Gage Steel Studs offer unparalleled performance reducing heat transfer across the flange – while maintaining stiffness and strength. Acoustics are much improved over glass or rock wool insulation.



These precast wall assemblies are lightweight, structural, insulating, **Fire Resistant, & Sound Dampening**. They offer the potential for huge savings in both time and manpower for medium to large commercial construction projects.

For more information, contact:
ATI-Composites – Edmonton,
Alberta, Canada 01 (780) 231-4793

Fig. 1

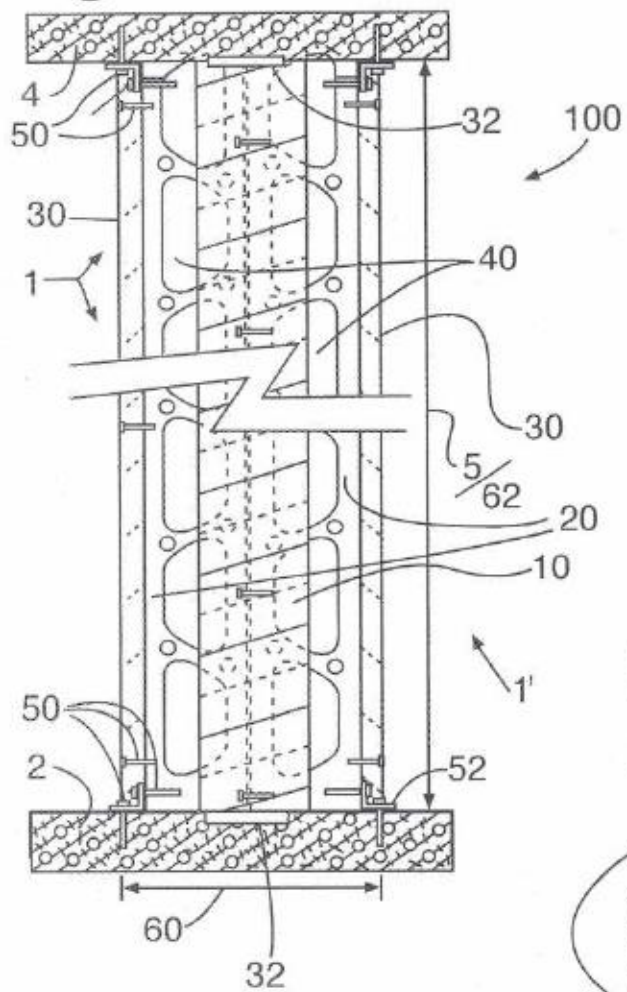


Fig. 2

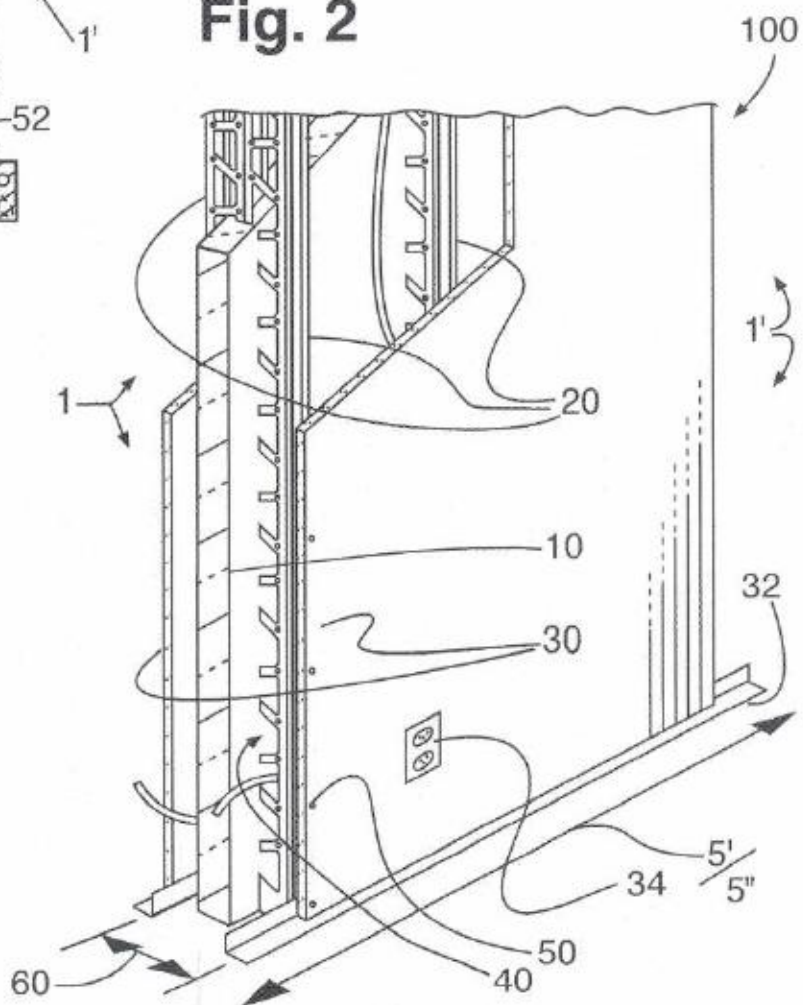


Fig. 3

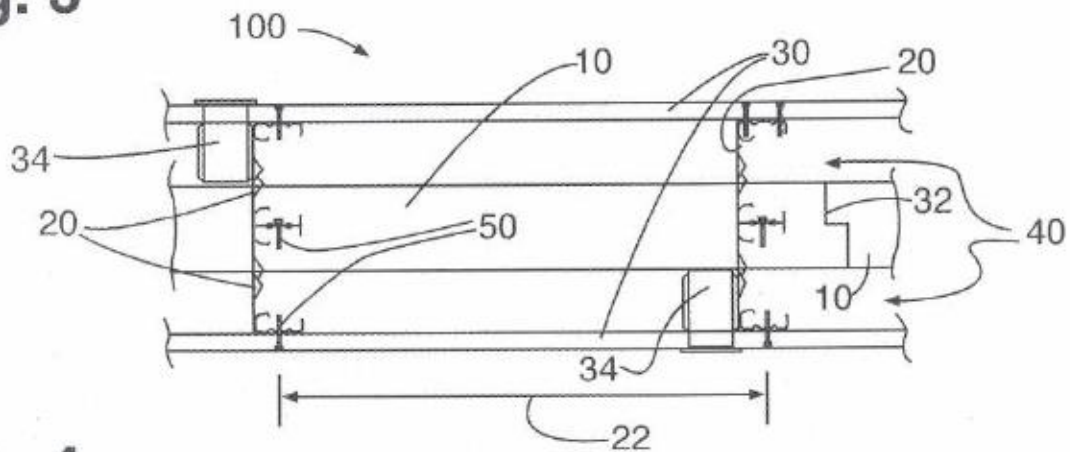


Fig. 4

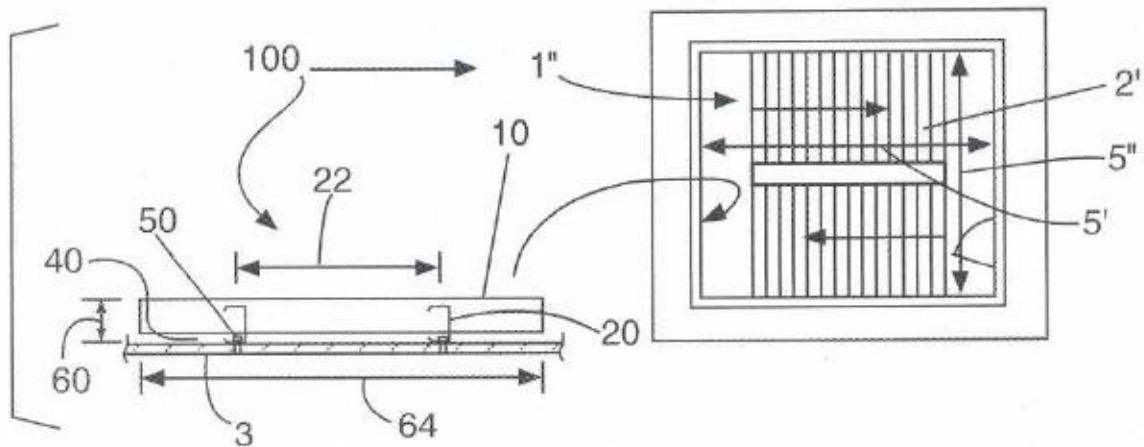


Fig. 5

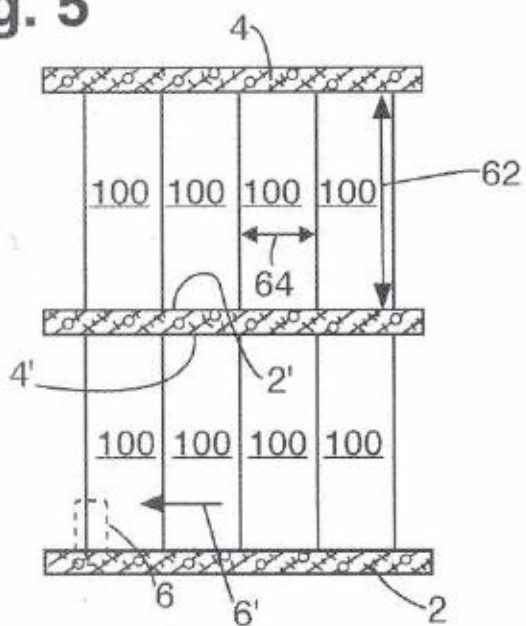


Fig. 6

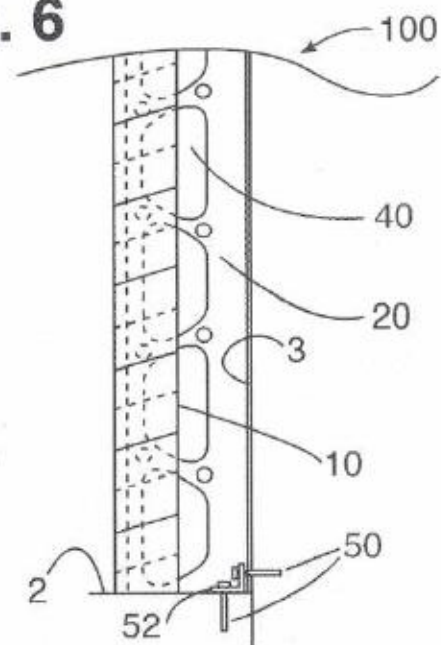


Fig. 7

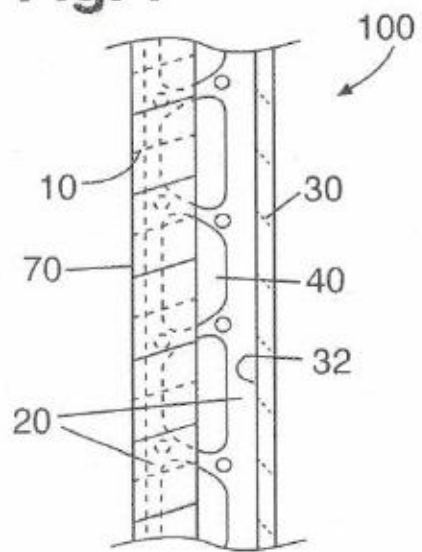


Fig. 8

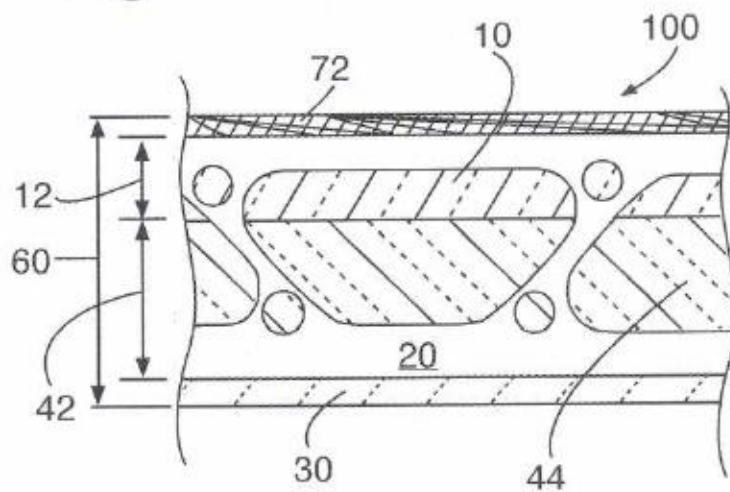


Fig. 9

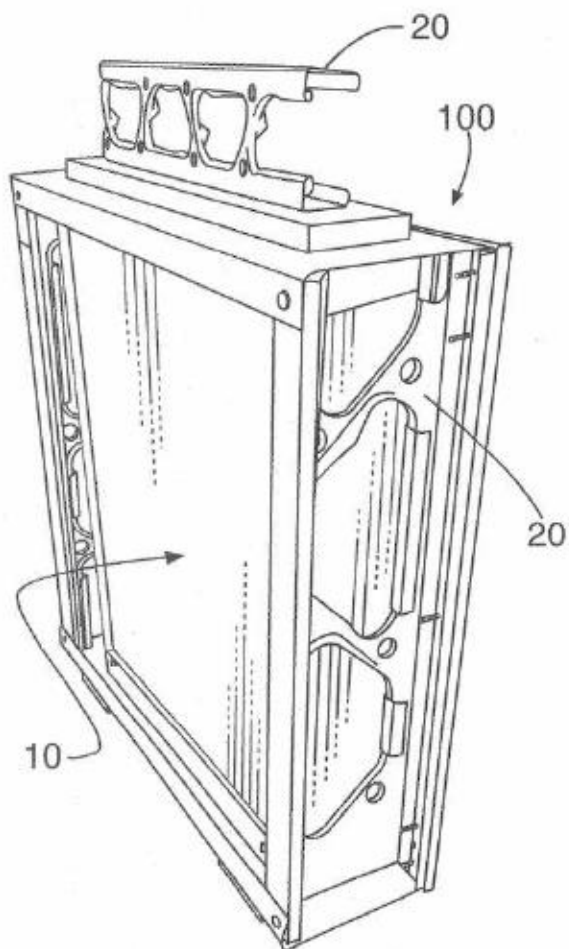
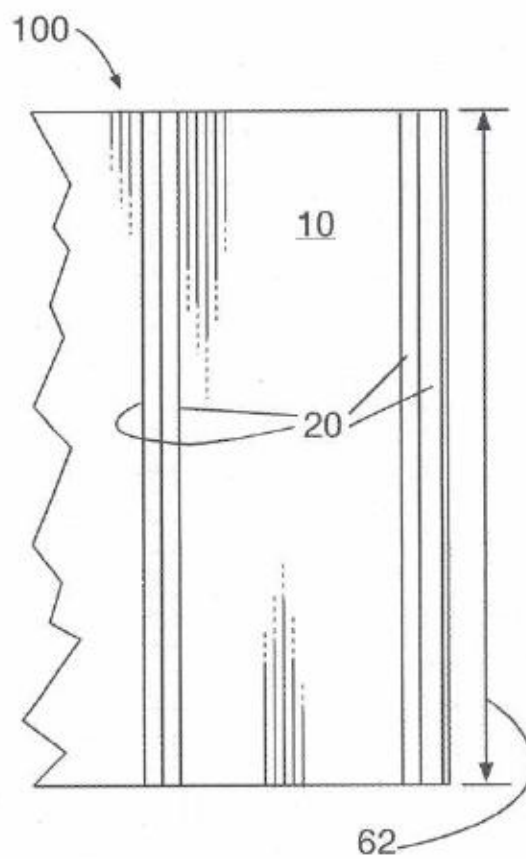


Fig. 10



BRIEF KEY TO REFERENCE NUMERALS

The following constitutes, in brief, a key to reference numerals that are found within **FIGS. 1-10**:

1 = first room of a building structure.

1' = second room of the building structure.

1'' = third room, e.g., stairwell, of a building structure.

2, 2' = floor of building structure, excluding any panel assembly of the invention.

3 = wall of building structure, excluding any panel assembly of the invention.

4, 4' = ceiling of building structure, excluding any panel assembly of the invention.

5, 5', 5'' = height, length or width, respectively, of a room of building structure.

6 = detailed space for **FIG. 6** as displayed by the dashed-line geometrical form in **FIG. 5**.

6' = arrow indicating direction of view in **FIG. 6** as displayed in **FIG. 5**.

10 = lightweight, fire-resistant composition of the invention, cured, e.g., in panel form.

12 = thickness of the cured, lightweight, fire-resistant composition of the invention.

20 = stud imbedded in the cured, lightweight, fire-resistant composition of the invention.

22 = distance between centers of spaced apart, adjacent, imbedded studs.

30 = building/room-interior-residing/facing panel of the panel assembly
of the invention, e.g., gypsum board (drywall).

32 = odor, vapor and/or smoke barrier.

34 = utility box, e.g., electrical outlet box.

40 = cavity or space to put in wiring, plumbing, insulation, etc.

42 = thickness of the cavity or space.

44 = foam insulation blown into the cavity or space, e.g., PU foam.

50 = fasteners, e.g., screws.

52 = brace for use with certain fasteners.

60 = thickness of the panel assembly of the invention.

62 = length of the panel assembly of the invention, e.g., height when used as a wall.

64 = width of the panel assembly of the invention.

70 = exterior residing/facing surface or finish of the panel assembly of the invention.

72 = exterior-residing/facing panel of the panel assembly of the invention,
e.g., external sheathing, say, OSB sheathing.

100 = panel assembly of the invention.