

Technology Licensing Opportunity

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Background

The North American building codes have been evolving towards LEED-certified, high fire-rated and True-R-Value building envelopes for residential and commercial structures. As population & building densities continue to rise, the demand for greater fire resistance between occupancies also rises accordingly. Through years of R&D and product refinements, ATi Composites Canada, Inc. has developed nanotech-based, patented, composite for use as a base material in 1) composite “Mineral Foam” which is an efficient alternative to Portland cement for use in several construction applications, and 2) a patented wall panel systems for use as Fire-Rated, Structural Insulated Panels (SIP) and “Tilt-Up” Wall Panels.

The Company: ATi Composites Canada, Inc.

Mr. Michael Mabey founded ATi Composites Canada, Inc. more than 10 years ago. Since then, the Company has been providing innovative Fire Retardant and Fire-Resistant composite material for various applications to companies in the US and Canada. The fire-retardant paint was commercialized under the successful brand, Barrier TEK. These products were developed from Mabey’s patented technologies (see Mabey **USPTO Mabey, Michael John for details on 5 US patents on the subject**). In 2019, Mr. Mabey was issued a new US patent (Mabey, 10, 346,185) which includes new chemistry providing increased functionality and fire resistance of the material.

Objectives

We are seeking one of these three (partner) opportunities:

1. An investment to commercialise the technology in the multi-family, high-rise and commercial construction markets in Canada and the US;
2. Co-develop the product for applications in curtain walls, exit stairwells and elevator shaft wall applications;
3. Licensing the technology for regional, national, North American and international markets.

Innovation/Technology Map

Product	Applications	Benefits
ATI-Composite, a versatile cementitious binder	<ul style="list-style-type: none"> • Alternative for Portland cement • Fire proofing & insulation • Tilt-up construction • Structural Insulated Panels • Fire-Resistant doors • Tiles for roof • Alternative to gypsum board products. 	<ul style="list-style-type: none"> • True R-30 rating at less than 8 inches thick. • Fire rated for 2 to 4 hours. • Can be pre-finished with various surface features such as an extremely tough exterior facing that can withstand abrasion and abuse during transportation and installation. • Can provide extremely hard polished or textured face which mimics ceramics or polished stone. • Can be painted. • High-value to customers and high-margins at lower cost.
Wall Panels	<ul style="list-style-type: none"> • Stairwell • Elevator shaft • Interior partition walls • Exterior walls 	<ul style="list-style-type: none"> • NexSys® wall-panel system consisting of light-gauge, open web, galvanized steel studs and ATI's patented Nano-composite Mineral Foam technology. • lightweight, precast, non-combustible fire rated, insulated, effective sound-dampening, versatile, low cost, easy and fast to assemble, significantly shorter building completion time. • Wall panels can be as thin as 4 inches for interior partitions to more than 8 inches thick for an exterior or demising wall. • Versatile: Can be designed to accommodate a wide range of applications, wind loads, etc. • Relocatable to accommodate needs of new or existing tenants in commercial rentals. • Connections details built into panels for ease of installation. Can be installed under any weather conditions without the added cost of heating and hoarding.

Competitiveness & Benefits

<p>Construction/Building code</p> <ul style="list-style-type: none"> a. High strength b. High fire rating 	<p>Value-add to a construction company/trade</p> <ul style="list-style-type: none"> a. Low project cost, in-house manufacturing using locally sourced material and commonly used equipment. b. All materials and components readily available across North America. c. Low cost and easily scalable nationally and internationally. d. Light weight stackable assemblies provide ease of loading-unloading, and shipping. e. No change management required. f. Competitive pricing. g. No construction delays due to factors such as shortage of skilled labour, winter or rain and thus no scheduling delays.
<p>Cost-saving/Profitability</p> <ul style="list-style-type: none"> a. Lower cost and increased margins. b. Pre-cast 'tilt-up' wall assemblies installed in minutes. c. Unskilled labour can be used for manufacture and tilt-up of the assembled wall panels. d. No heavy equipment required to tilt up e. No scaffolding, heating, and hoarding and lower transportation cost. f. Can be built onsite or in an ordinary warehouse under any weather condition. 	<p>Value-add to customers/users</p> <ul style="list-style-type: none"> a. Durable construction, less prone to damages, low maintenance and low utility cost. b. Comfortable living/work environment due to material properties such as high-insulation, - fire-rating, and sound dampening. c. More useable space due to thinner wall profile. d. Lower weight means lighter structures, smaller footings and lowers costs.

Case studies

Case Study: Number 1:

In early 2015, ATI was approached by a company in Washington State to see if we could reduce the costs associated with producing elements for their fire-rated curtain walls. At that time, they were paying up to US\$35.00 per square foot for the Pilkington fire rated glass but up to 30% of that glass was being covered with solid materials to produce a non-transparent pony wall on the second and subsequent floors of the building. ATI was tasked with producing a light weight solid slab at less than US\$20 per square foot to reduce costs of the finished wall assembly. After several months of effort, we were successful in producing a product that we currently sell to them at \$18.50 per square foot at 1 inch thick. This equates to a selling price of US\$5,995 per cubic yard. This material weighs on 40 Lb/Ft3 (water weighs 62.5 Lb/Ft3). After a number of trials the project evolved to include mullions made from light gauge galvanized steel with an ATI-Composite mineral foam core. These mullions have been in production for several years and they form the basis for ATI's current business operations.

Case Study: Number 2:

In 2018 ATI was involved in a fee-for-service research project to develop a 90-Minute Fire Rated door core for a company in Indiana. This project involved developing a light weight fire resistant core to compete with a product that was produced by Georgia Pacific. This project ran for 6 months and resulted in a successful product which went into production in the US for the client company. The most interesting aspect of this new door core was that the fire codes do not specify a 90-Minute rated door. However, given the availability of the door, the demand has grown, perhaps because the architects and engineers chose to adopt the additional safety features of these doors, regardless of the added cost. This building design / preference may bode well for the launch of ATI's fire rated wall assemblies.

Potential weaknesses

Access to market: Some experts have suggested that this new assembly will be a 'paradigm shift' in commercial construction but getting this into the market requires time and resources. Concrete block construction is the most common stand-by product because it is familiar and commonly used. We will need to get in front of the designers and spec writers to make them aware of the benefits of the NexSys® wall-panel system for a construction company, for trades and for the end-users.

Current Status

Over the past year or two, we have run a number of small scale Fire Tests on the panels at Intertek and another private company to determine the efficacy of the Composite Mineral Foam under the ASTM-E119 or ULC-Can4-S101 "Fire Resistance of an Assembly. These 1/3 scale tests demonstrated significant promise for the full-scale test which would be required before we could market the wall panels for commercial applications. Since these tests and certifications would be assigned to a particular manufacturer and/or location, we have held off completing any large-scale tests until we have found a partner or licensee. In addition, we have been cautious about releasing too much specific information until the patent applications for Canada & the USA were completed. The US patent was issued in mid-2019 and the Canadian application is pending.

Preferences/Requirements for Potential Partners

- Current knowledge of the construction business.
- Market presence in the region where they would be operating.
- Forward thinking management style.
- Adequately capitalized to manage the development of the market and various applications.
- Knowledge of the tilt-up and precast industry would be preferred.

Appendices

Stairwell/Elevator Shaft Wall Assembly

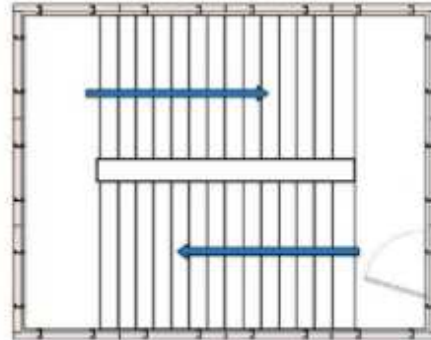
Product Detail

Stairwell / Elevator Shaft Wall Assembly

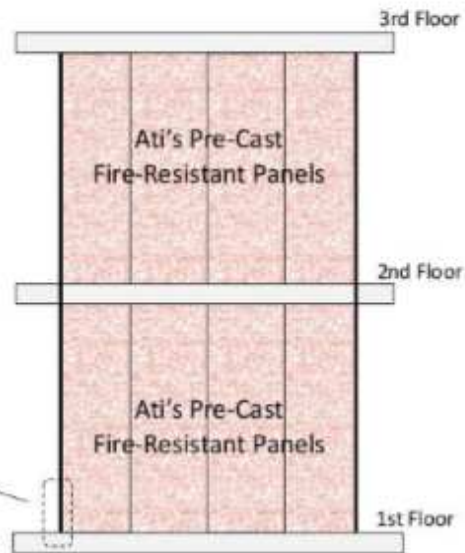
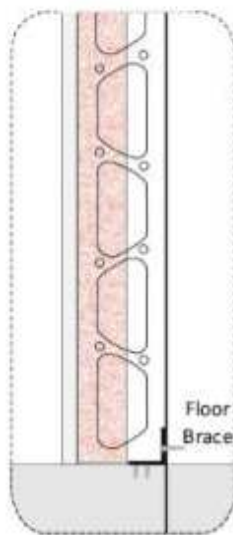
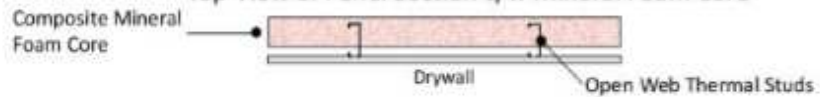
**Tilt-into-place
2-Hour Fire Resistant,
acoustic dampening,
stairwell/elevator
shaft wall system.**

- 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)



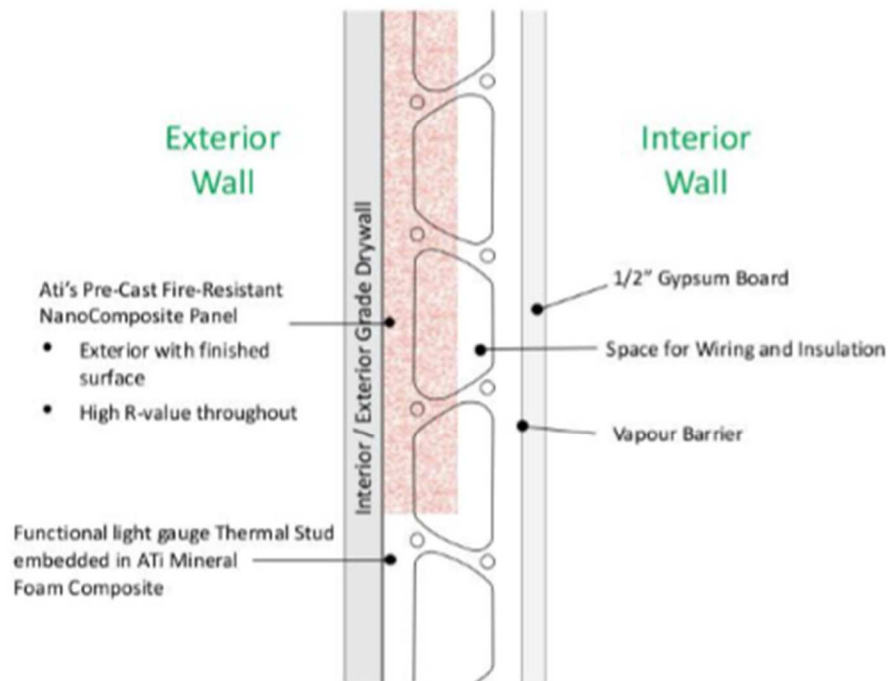
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Curtain Wall Assembly - Interior/ Exterior

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

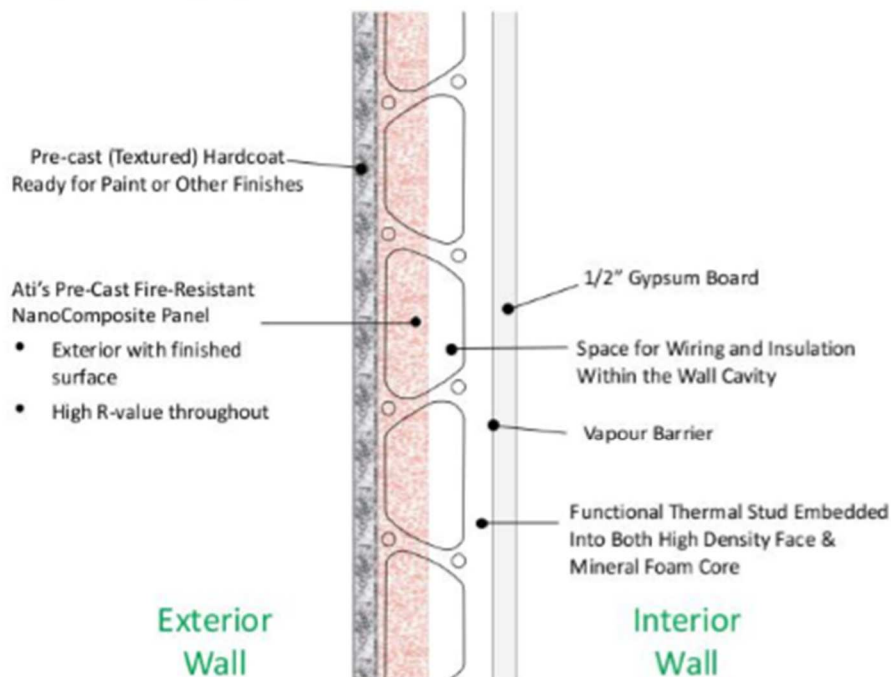
- Space for wiring, plumbing and extra insulation
- Functional exterior wall, ready for rain screen or other finishes
- Sound dampening
- Thermal stud available in a wide range of widths, gauges and load bearing capacity



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”



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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

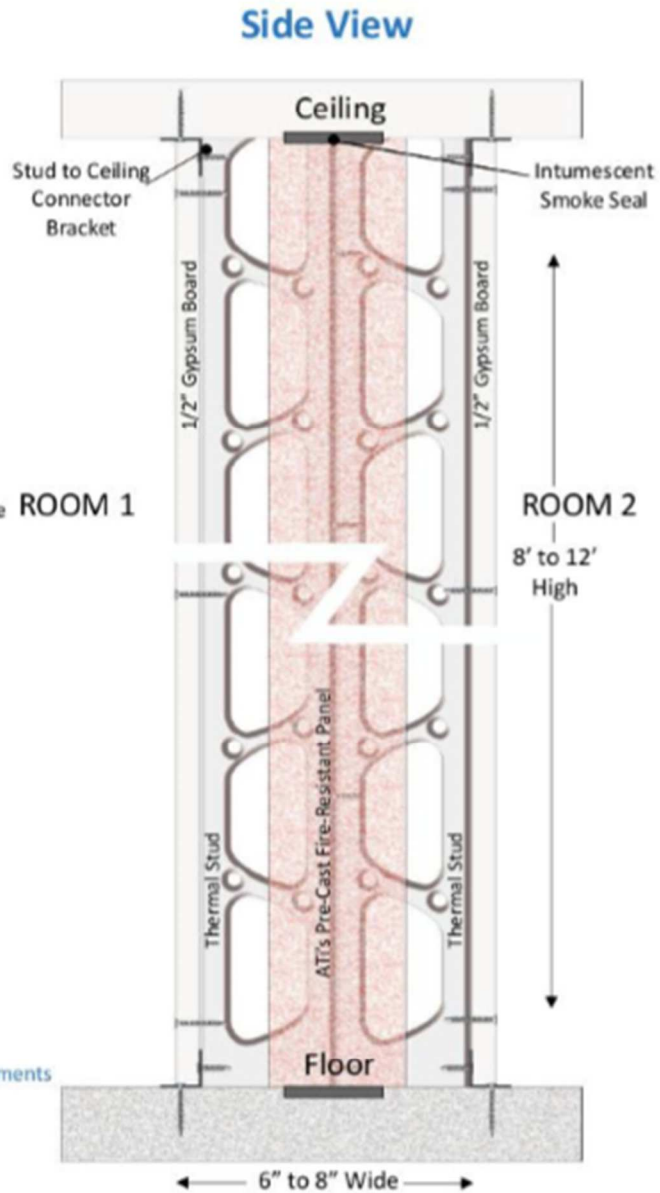
- Easy to handle, ship and install by drywall trades

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



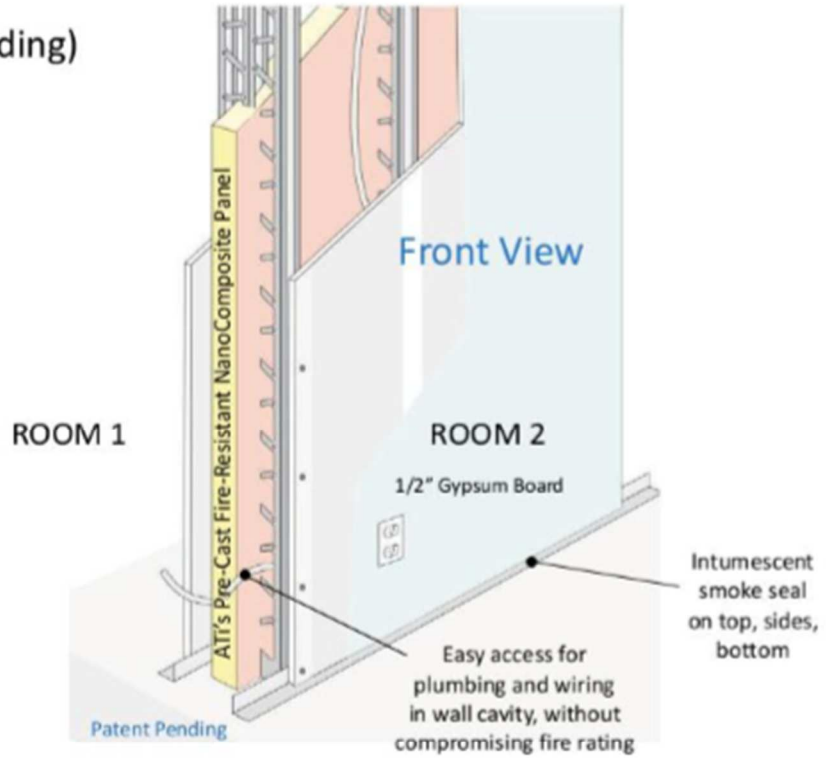
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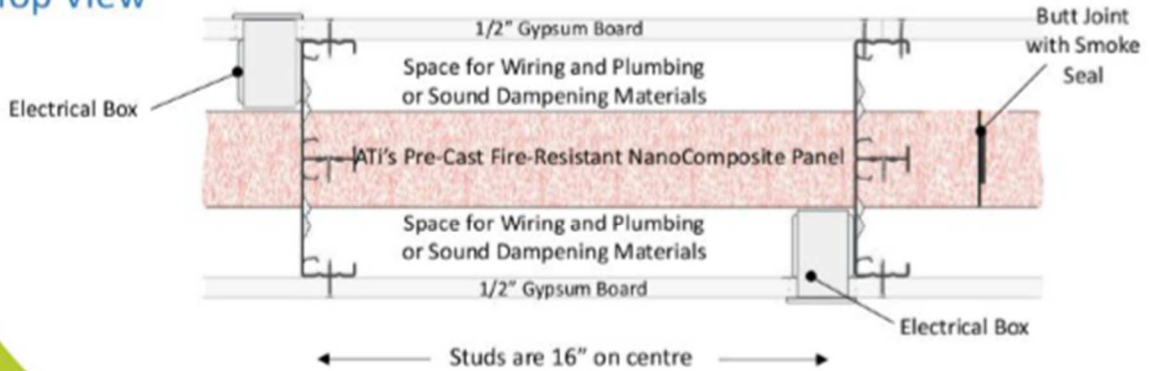
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Acoustic & Fire Separation Party Wall Assembly

(Patents Pending)



Top View



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