MODCOACH News

Gary Fleisher, Modular Construction Industry Observer and Information Gatherer

Westchester Modular Homes, Inc. — Westchester Modular.com • (800) 832-3888

Franchising impresa Modular — We're searching for motivated, knowledgeable entrepreneurs! — The Path to Success with Off-Site Construction — Free Franchise Report

Sunday, May 3, 2020

What's New in Modular Construction?

One way to find out about innovation in the modular construction industry is to see what start-ups are doing. I talked with people at six young companies (all less than three years old) to discover the exciting things they're getting up to.

Crate Modular

"Basically, if you can build it, you can build it with Crate," says Amanda Gattenby, VP of Development at Crate Modular — a company that turns shipping containers into habitable buildings.

Crate's initial projects were to replace schools' temporary classrooms. Now, in addition to schools, they also work on hospitality projects, commercial food court and beer garden projects, as well as housing. The housing includes ADUs (accessory dwelling units), affordable housing, and homeless shelters.

The company was founded in 2018 and acquired a couple of modular companies, one with a factory in Carson, California, USA. This is where Crate now transforms its shipping containers.

"We use shipping containers that have come one way, containing dry goods only," says Gattenby. "Every container has a serial number, so you can track when and where it was built, where it's travelled, all the inspections it's had. Often, the containers we receive are only 90 days old. We also do our own testing, to make sure the container is up to our standards."

Because the US imports way more than it exports, Gattenby says there are 4 million empty containers available in the country. This means Crate can be very picky about which containers to use in their projects.

The sustainability aspect is important to Crate.

"Containers are a recycled resource, and they're very durable. Shipping containers exceed the California building code for structural and seismic by several times. The resulting buildings require little up-keep. And they have a great thermal envelope, which makes them energy efficient," says Gattenby. "The steel construction and the well-insulated envelope also mean that the buildings have very good acoustic properties. There's no floor-to-floor or side-to-side sound transmission between units."

To turn become habitable buildings, the containers go through an assembly line in Crate's 110,000 sq ft factory.

"We start out with the demolition, the cutting and grinding, then the roof structures, then we frame them out, we put windows in. We put a structural steel c-channel around the perimeter of the box. This becomes an interstitial space where we run our MEP [mechanical, engineering, plumbing], and it also adds rigidity. So we're able to cut out both sides of a 40 ft container so it's a completely clear 40 ft span. The containers come out complete with painted drywall finishing, electrical and plumbing finish and trim in place, cabinets, countertops, tubs, bathroom accessories."

Once all the materials have been procured and the line starts, Gattenby says it takes between 10 and 14 days for each container to be completed.

"We're fast. For example, for a 150-bed homeless shelter we built, we drew the plans in 60 days, we got the state-wide approval in California in 48 hours. We fabricated it in 4 months, and it was set on the foundation in 4 days."

The company also increases the speed of construction by re-using designs.

"We have a catalogue of buildings that we've built before. So if any of those meet a client's needs, they can save time and money because we've built it before. We can replicate and leverage that knowledge," Gattenby says. "We're really trying to shift the paradigm to buildings as products."

C-Cube

Founded last year, C-Cube appeals to a niche market — that for 'clean rooms' in the life sciences industries.

Biotech or pharmaceutical companies have very specific requirements for their working environments. When growing cell cultures, for example, they don't want specks of dust or pollen from the air falling into their petri dishes. In a clean room, fresh air is filtered as it enters the room, and air is constantly removed as fresh air enters. And this needs to happen with minimal air turbulence. The room must also be airtight, so unfiltered air doesn't seep in.

There are international standards for clean rooms. For example, Christophe Mermaz, Co-Founder and Managing Director at C-Cube, explains, "For an ISO 7 room, all the air in the room must be changed every two minutes."

The air entering the clean room passes through HEPA filters that capture 99.97% of particles as small as 0.3 microns. (An average human hair has a diameter of between 50 and 70 microns, so we're talking *really small* here.)

A clean room also needs to be fully flush. (I.e. it has to have completely smooth corners, such as between the floor and the walls, with no nooks and crannies.) Each module also has to be completely waterproof and insulated.

Mermaz believes that modular construction is the ideal method for creating clean rooms. The factory environment enables high precision manufacturing, which results in tight building envelopes.

Each C-Cube module is also 'smart'. Temperature, air pressure, humidity, air quality and so on are all measured constantly and can be monitored remotely. The building manager can be alerted if, for example, there's a temperature fluctuation outside the acceptable range. They can then make adjustments remotely to fix the problem.

In addition, a company that's using a smart clean room to produce vaccines for a client, for example, can provide data about the environment during production of that client's batch of vaccines.

C-Cube's competitors make 'pods' that must be put under the roof of an existing building, which makes them hard to change. But C-Cube's modules are complete buildings, which have been designed with flexibility in mind.

"Immediately under the removable roof, each module contains its own air ducting, utilities, electricity, and guttering," Mermaz says. "To simplify the construction process, and keep costs down, we'll manufacture only three different sized modules. But they can be configured in multiple ways, including on top of one another."

C-Cube's modules are also relocatable, which provides lots of flexibility — to change the building's configuration, to add or remove modules, or to move the entire building somewhere else.

Mermaz says that the idea of modular clean rooms is appealing to start-ups. They might need only a small space to begin with, but can increase space later with additional modules. "They don't need to stop production while we come and add space," he says.

"It's also helpful for larger companies that operate in different countries around the world. Modules can be set up in one country and, if conditions change, they can be moved elsewhere."

C-Cube's first prototype is almost finished now, and the company has started to provide quotes to potential customers. "Our prototype will show people the quality they can expect from our Asian manufacturing team."

Splash Modular

Joel Hutchines, who is now the CEO of Splash Modular, started his working life as a carpenter. Eventually, he became a general contractor, then an architect. During his architecture studies, he discovered computational design and digital fabrication. He learned more about them while working for Shigeru Ban in Tokyo and with his own design-build firm, Studio Workshop.

Splash Modular was founded last year. Hutchines says that although they make bathroom pods from kits of parts, it is fundamentally a software company.

At the moment, when an architect designs a bathroom, for example, he or she typically sends drawings to the project's consultants. The consultants interpret the design, and request changes based on supply chain and cost limitations that they're aware of. The architect then adjusts the design to take those limitations into account. This back and forth process may be repeated many times.

In contrast, when using Splash Modular's software, a designer works within such limitations *from the beginning*. This is because customizable parameters are built into the software's algorithms up front, before the designer starts work.

The parameters are based on the materials used, transportation and other logistics, building site limitations, and the capabilities of automated machinery and robotics. The level of detail built into the software makes it possible to estimate to a high degree of accuracy how much each bathroom will cost.

This 'File to Factory' software sends data directly to the manufacturers of the parts of the kits that make up a bathroom — including scheduling information and the code to run their machines. This eliminates the need for shop drawings or extra software to relay information.

The software also sends data to the companies that supply materials and products to the parts manufacturers. Everything is carefully coordinated, and the parts of each kit are transported from the various manufacturing facilities to a Splash Modular licensee's factory where they are finally assembled into bathroom pods.

Splash licenses the production line and the process of creating the parts of the bathroom kit to others.

"The highly efficient assembly line is owned and operated by our licensees," says Hutchines. "But we own the design, our software runs the design and scheduling, and we charge a flat rate on every bathroom that runs through that assembly line."

When a factory buys a license, they also get exclusive rights to Splash Modular's own projects in that region. "Our licensees work on their own projects, but under the exclusive region deal they also produce work facilitated by us," Hutchines says. "Let's say Splash has a relationship with a large hotel chain to build all their bathrooms. We bring that work to our licensees' factories, providing them with a revenue stream in addition to their own projects."

So, although Splash sells complete bathroom pods, they don't own any factories. Their licensee partners manufacture the pods from parts that are manufactured elsewhere.

Hutchines says that the software allows Splash Modular to become "virtually vertically integrated". He claims that the streamlined manufacturing results in a far better process, which everyone can all benefit from.

"Amazon showed the world how e-commerce can work by starting with selling books," Hutchines says. "The bathroom pods are the way that Splash is showing the potential of our software".

Impresa Modular Franchising

Although Impresa Modular Franchising was launched only a few months ago, Impresa Modular has been around since 2008. (It used to be called Express Modular.)

Impresa Modular allows homeowners to select and customize a plan for their home — or even design their own modular home from scratch. (I love looking at floorplans, so I spent way too much time browsing on this site!) In essence, the company sells homes over the internet. Impresa Modular doesn't own factories, or physical sales centers, and they don't have model show homes they can show homeowners.

Instead, what Impresa Modular has done over the years is to build a network of modular builders they partner with across the US. This enables Impresa Modular to deliver custom modular homes anywhere in the country without having to transport the modules too far from the factory where they were manufactured.

"We became the Amazon of modular construction," says Ken Semler, President and CEO of Impresa Modular. "We owned the internet. But we weren't making all the sales we could because we didn't have the local physical presence. Homeowners want to go out and see someone in person at the sales center."

Impresa Modular Franchising is the next step. Semler says, "We already have the brand. And franchising gives us our local footprint, making use of the relationships we already have in place."

Semler says the response has been positive.

"The factories we've approached to become franchisees were our partners already. So they know they don't have problems with our houses or our customers. They know that the builders who work with us are well-trained, understand the scope of work, and have appropriate expectations. A factory that becomes a franchisee doesn't have to do anything other than what it wants to do: manufacture modules."

Impresa Modular Franchising provides training to franchisees who need it. An unexpected side effect of providing this training is that Semler has been approached by developers who don't want to become franchisees — but they want help adopting modular construction.

"They don't want to become a franchise because they don't want to sell homes to everyone. They just want to sell homes on the lots they own. So, Impresa sells the homes to them and also provides the training the developers need."

A change from the original plan is that franchisees are not required to be fully modular.

"Some builders want to add modular construction alongside their on-site building business, instead of jumping into modular with both feet all at once."

About the company's long-term goal, Semler says, "We'd like to grow our franchise network to have factories and builders in every region in the US."

Moducore

For years, Jordie Puchinger and Bill Oliver were senior operators of a modular manufacturing facility, working with MPE Engineering as their prime engineering partners. They looked for software to help operate the facility and increase efficiency, but they couldn't find what they needed. So, they created their own — spending 5 to 6 years developing it and testing it on the shop floor.

Eventually, Puchinger and Oliver teamed up with an engineer at MPE Engineering, Dan Wood, and co-founded Moducore last year, under MPE Engineering.

With decades of combined experience in the modular construction industry, Puchinger says that the Moducore founders' real-world experience gives them a deep understanding of what the industry needs software to be able to do. And software for typical manufacturing companies simply doesn't work for modular manufacturing.

"A typical factory might make millions of completely identical widgets. Modular construction is different," Puchinger explains. "Suppose, for one single structure, a factory is manufacturing ten units — which may differ from one another. With ordinary manufacturing software, you'd need to manage ten different Bills of Material. But in Moducore, you need just one because it covers the entire project horizontally. Each module is automatically managed 'behind the scenes' in Moducore, so you don't need a separate Bill of Material for each unit."

The software is described as an end-to-end platform for modular manufacturers. It covers sales, through design and estimating, engineering, manufacturing, procurement, shipping and receiving, all the way to the final construction site.

Puchinger says that although some great software is available, none of it connects the manufacturing facility and the site in one package. This is a problem because in modular construction, manufacturing and site work happen at the same time.

"If you've got software managing your plant, and another piece of software managing your site, they probably won't be able to talk to one another. And if you need to use two systems, someone has to manage that data and build reports —there's no real time reporting." Ease of communication is a key element of the Moducore software. It includes activity streams, communication tools like click-to-call, in-platform customer service chat, text message notifications, email and system alerts.

"These are small tools that make a world of difference in the long term. Those seconds and minutes add up. For example, it's very expensive for the manufacturing plant when a line is down, and rapid communication can make a difference."

Moducore also provides consulting and engineering services through their partnership with MPE Engineering — which has decades of experience in modular engineering and design. "We can design and engineer a manufacturing facility, including all the robotics equipment, to help new modular factories get started up."

Boxabl

Years ago, the Boxabl CEO had built a large modular house in Connecticut. Transporting the modules from the factory to the site required all the available over-wide permits in the state for just this one project. This was the initial spark for the idea of modular buildings that are easier to transport.

"If you can't ship it, it doesn't make sense to build it in a factory. You're just going to lose all the efficiencies you gained," says Galiano Tiramani, Business Development Manager at Boxabl.

Tiramani explains that transporting oversize loads by road is both logistically challenging and expensive.

"With an oversize load, in addition to the truck driver, you need a follow car, and you sometimes need a police escort, you might also have restricted routes and travel times."
Boxabl's solution is to manufacture modules that fold up to 8 ½ ft wide so they're highway legal without an oversize permit. (The modules also fit on other forms of transportation such as trains and container ships.)

The company was founded and started doing research and development in 2017.
"We figured out how to get everything finished inside, and to still be able to fold it down to 8 ½ ft. Within that 8 ½ ft, we have 6 ft of empty space where we can house the kitchen, bathroom, staircase, etc."

In their quest for efficiency, Boxabl uses simplified wall assemblies that are fast to manufacture. Giramani says they also have superior ratings for fire, structural, seismic, and energy efficiency.

"The wall panels are made from EPS foam laminated to steel, and magnesium oxide board. The raw materials come in and get processed by off-the-shelf CNC cutters. Compared to typical wall assemblies, the components are assembled really quickly, they're bigger, use less total material, and less labor is required to assemble them."

At the moment, Boxabl uses a lot of manual labor in their factory. But they're aiming for much more automation in the future, and these simplified assemblies are a good fit for that goal. They're also planning to have only a few different models for each room (a handful of different kitchens, bathrooms etc.). But it will be possible to put the modules together on the site in different ways. So, there'll be standardized manufacturing in the factory, and custom construction in the field.

Currently, Boxabl is targeting the ADU market with their Casita module.
"The Casita arrives onsite and unpacks [ZR1] in about an hour on a foundation that's already been prepared. The kitchen, bathroom, refrigerator, washer, dryer, it's all in there. You unfold it, and it's good to go."

Tiramani says that they've have intense interest in the Casita and they're currently raising investment funds to move to a bigger factory. "People are putting down their $100 deposit to get on the waitlist to buy a Casita," Tiramani says. "We think we're going to have thousands of orders before we get the bigger factory where we'll be able to fulfil them."
Efficiency is a driving force at Boxabl.

"We think buildings should be built the way everything else is built, like your car and your iPhone. We want to gain those efficiencies and bring costs down so that it has a real impact on housing affordability," Tiramani says. "We want to bring pre-industrial construction into the post-industrial world."

Zena Ryder is a freelance writer based in beautiful British Columbia, Canada. One of her specializations is writing about construction, especially modular construction. Her website is **Zena, Freelance Writer**.

If you're interested in having her write for your modular construction business, you can email her at zena@zenafreelancewriter.com.

on May 03, 2020

No comments:

Post a Comment

Enter your comment...

Comment as: zena@boudicaw Sign out

Publish Preview Notify me

Newer Post Home Older Post

Subscribe to: Post Comments (Atom)

Quartz — Quartz Properties: You believe in modular, so do we. Let's build together. 844.251.6761

Is the Modular Industry Ready for Post-COVID-19?

Follow by Email — Email addr Submit

Manorwood, New England, Pennwest, Commodore Homes, R-Anell Homes, Signature, Durabuilt Homes, Ritz-Craft, Muncy Homes, MBSP, New Era, Rochester Homes, Nationwide, CBS, Dickinson Homes, BOXABL, Heckaman Homes, Icon Legacy, Westchester, Silver Creek, Apex Homes, Sea Box, Simplex, Manufactured Homes — MhCRM: The fundamental toolkit for factory-built housing professionals. Sales + CRM, Deals Pipeline, Marketing Automation, Streamlined marketing wrapped up in an easy-to-use platform. mhcrm.com

MHBA, Modular Home Erectors, Architect — New Hampshire Design Collaborative, LLC (Woman Owned), 2Morrow (Architect), LGA Recruiters, Robert Sage, MODULAR HOME BUILDERS (New Home Builders that feature modular construction), The Home Store (Serving New England and New York), Select Modular Homes (Serving New Jersey), FinishWerks (Serving MD and surrounding states), Zarrilli Homes (Serving NJ. Featured on "This Old House"), Cutting Edge Homes (Serving the West Coast and International Market), Pro's Edge Homes (The Modular Homes Experts), Green-Living Homes (Serving Maryland)

Search This Blog — Search

Report Abuse

Receive My Newsletter 3 Times a Week! — Sign Up for Email Updates — For Email Marketing you can trust.

US Modular, Inc — USModular: Multi Story & Multi Family, Hotels & Motels, Affordable Housing, Assisted Living & Mixed Use, Custom Single Family, Faster Better Greener & for LESS! 888-987-6638

Modular Homes — Modular Homes: 24/7 Lead Generation. Real buyers. Real-time. Real results. Price quote. We can help your business grow. ModularHomes.com

Impresa Modular, Mariotti Building Products, Glenco, Viking Carrier, 7D Windows, Heister House, Merillat Cabinetry, Hometown Heros (Simplex Modular), CM Advertiser, Millwood Kitchens, ICC NTA, LLC, Scott Bliss (732)948-2266, PFS Corporation, Citizens Bank, RWC Warranty, Yestermorrow (Design/Build School), Allegheny — Open Joist: Fire Code Compliant, CRM Homes, Go Modular SIP, Sica Modular Homes (Serving NJ), Shipshewana Homes, Dreamline Homes (Serving Massachusetts and New England), Advantage Homes (Serving Baltimore and Surrounding Counties), Serving New Jersey — Atlantic Modular Builders, Next Modular Builders (Indiana & Surrounding Areas), Eco Craft, Tri-County Modular (serving PA), Supreme Modular (Serving NJ, DE and PA), Eagle Associates (Serving the RI area), Hudson Valley Homes (Serving NY,NJ and PA area), Saratoga Modular Homes, Greenfab, River Valley Builders (Serve PA and NJ), Connecticut Valley Homes (Serving CT, RI, Block and Fishers Islands), Statewide Homes (Serving NJ), Catskill Valley Homes