

By John Boyle

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Leave it to Asheville to be the first place in the country to build not just one, but two houses largely out of hemp.

Well-established as a green building center, Asheville has two homes under construction -- one in West Asheville, another off Town Mountain Road -- that use hemp as a building material. The builders and Greg Flavall, the co-founder of Hemp Technologies, the Asheville company supplying the building material, maintain that they're the first permitted hemp homes in the country.

"This area is known to walk the talk of being green," Flavall said, adding that the Asheville area has by far the largest percentage of Leadership in Energy and Environmental Design, or LEED, builders of anywhere in the country. Hemp is derived from the same plant that marijuana comes from. Although it contains very little of the active ingredient that gets people high and is completely impractical to smoke, it's still illegal to grow it domestically.

But builders can import industrial hemp products like Tradical Hemcrete, the material Hemp Technologies sells. When mixed with water and lime, it makes remarkably strong, resilient walls. Some builders generically refer to the walls as hempcrete.

Clarke Snell, of the Nauhaus Group, a collaborative of local companies building the West Asheville home at 67 Talmadge St., describes the resulting structures as "forever" walls. Should you take a wall down, the hemp inside is also reusable.

"Basically, the only thing that can tear this wall down is water," Snell said, adding that it would have to be a steady stream.

Flavall said the last study done in Europe puts the life span of hemp walls at 700-800 years.

"And even at the end of that, you can use it as fertilizer on a field," he said.

How it works

The hempcrete mixture starts with 55-pound bales of Tradical Hemcrete brand hemp shiv, or ground-up hemp plant stalks. Workers mix it into a standard concrete mixer, four parts hemp, one part lime and one part water. They pour the resulting slurry into small containers and then pack it between plastic forms that raise a wall two feet at a time. The walls are built around standard stick-built framing.

It takes about a day for a wall to dry and about two weeks before it's ready for exterior or interior coatings of lime stucco or plaster. Even with those coatings, the material still breathes.

"One of the main reasons I was drawn to the lime and hemp mixture is the breathability -- there's no mold, no mildew," said Anthony Brenner, whose company, Push Interior/Architectural Design + BuildTechnologies, is building the Town Mountain home. "The lime is constantly taking in carbon, so it's carbon-negative."

Hempcrete is also a natural deterrent to insects, and it's extremely fire-resistant, mainly because of the high lime content. It takes about 2 acres worth of hemp to do one house.

Cost calculations

Hempcrete is more expensive upfront than traditional building materials, mainly because of the shipping costs. Flavall says his company has to import it from Europe, which about doubles the cost.

For the Town Mountain home, he'll use about 1,875 cubic feet of hempcrete, at a total cost of about \$56,250.

That's higher than typical construction, but Flavall says you'll net a 30-40 percent reduction in framing costs because less lumber is needed. You also have the potential for a lighter foundation because the hempcrete walls are lighter. Also, homeowners may be eligible for a 10 percent reduction in insurance rates because the product is so flame-retardant.

Nauhaus partner Chris Cashman points out another major advantage: "With this, it's your Sheetrock, insulation and Tyvek (moisture barrier) all rolled into one."

Calculating the cost of a Hempcrete home gets complicated.

"We think we can build a house like our prototype for anywhere from parity for a high-end custom home -- think Biltmore Village -- to 5-15 percent more for a typical home," Snell said. "However, that's not the point because construction cost is not your monthly cost."

He points out that a typical homeowner's monthly home costs include the bank mortgage, utilities, maintenance, insurance and more. If you're building a house that uses 15 percent of the energy of a conventional home, then you can take money saved on utilities and put it into construction and end up with the same monthly cost.

"Our mission is to provide carbon-neutral housing for the same monthly cost as a typical home," Snell said.

Tim Callahan, another of the Nauhaus partners, puts it this way: "The reason it begins to be affordable is because we've reduced the energy loads so much."

The costs over the long haul should appeal to the green-minded.

"The bottom line of this and a traditional house is it's about cost-neutral," Brenner said.

Labor-wise, it's quicker to put up the hemp and plaster than all those other materials like Sheetrock and insulation. Brenner said it will take them about a week to get all the hemp walls up. The Nauhaus guys have put up a test wall and are waiting on the plastic forms from Brenner to do all their walls.

Model efficiency

The house Brenner is building will have 12-inch thick walls, while the house on Talmadge Street will boast 16-inch thick walls and will be 80 percent more efficient than code requirements -- so efficient that Snell claims it could be heated solely by the body heat of 18 people.

Besides hemp walls, the 1,450-square-foot, four-bedroom house will have solar panels on the roof to generate enough electricity to power the home, with a surplus. It will have an earthen exterior made from the soil on site, rainwater gathered from the roof and a mostly edible landscape.

The home will be a prototype that the Nauhaus group will use for tours and education.

The house will be owned by the Nauhaus Group itself, although chief engineer Jeff Buscher and his family will live it for two years before it's sold to allow for energy-efficiency analysis and other research.

Brenner is building the 3,100-square-foot Town Mountain home for Russ Martin, a former Asheville mayor and retired stockbroker, and his wife, Karen Corp. "We're not afraid of trying something new," Martin said. "We've always been adventurous that way, and this looks like it's going to work out really well."

Snell stressed that getting the Nauhaus going has involved a massive, collaborative effort involving multiple local companies.

Based in Asheville, the project is led by Think Green Building, Eco Concepts Development, Eco Concepts Realty and Green Plan.

Both Brenner and the Nauhaus partners want to expand hemp building far and wide.

Brenner said he's working on a commercial project in Maggie Valley and another home in the Leicester area.

And they'd love to see farmers have a chance to grow hemp legally.

"Our feeling is: What a great crop this would be for North Carolina's tobacco growers to get into," said Callahan, the Nauhaus partner. "Bringing this in from

England is probably not the greatest idea (economically). If local farmers can benefit from this, it would be great for them and great for the economy."

Still, as Snell puts it, right now "what you have is a product that you can't grow but you can buy" in the United States.

Brenner thinks the technology will take off when potential homeowners and developers come to understand its advantages.

"We've been seeing interest from all over the country," Brenner said.

"People are truly interested in green construction and green building, and I don't know how much more green you can get than this."

Flavall said another hemp house will start up next year in Franklin, and he's receiving strong interest in other projects.

"I'm seriously of the belief that we're making history here," he said.

On the Net: <http://thenauhaus.com/index.php>

www.pushdesigns.net

www.pushhouse.blogspot.com